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With Which Is Combined

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# Kraft Paper Interests Form New Institute

## Structure Provides for Two Separate But Co-Ordinating Divisions Representing Kraft and Bag Manufacturers—R. J. Cullen, of Southern Kraft Corp., and Continental Paper & Bag Corp., Heads New Organization—D. C. Everest,of Tomahawk Kraft Paper Co., Elected Chairman of Paper Division—Institute Will Compile Current Economic Data.

Great progress has been made towards the economic stabilization of the kraft paper and bag industries, through the recent formation of The Kraft Institute. Fully 70 per cent of the productive capacity of both the kraft paper and bag industries was represented at the three days sessions held recently in which this new institute was formed, and it is expected that a still greater proportion of both industries will become members of the institute. The value of the output of these industries combined in 1930 was not less than $100,000,000.

The structure of the institute provides for two separate but co-ordinating divisions, representing the kraft manufacturers and the bag manufacturers. Each division will have its own directorate and manager, with their common problems co-ordinated by the executive committee of the institute, whose membership will represent both divisions.

### Liberty of Action Preserved

It is understood that the Kraft Institute will devote itself chiefly to the compilation of current information of statistical and other varieties for use ot the executives of the industry and to discussions of general economic principles and good business practices in the light of such information. Compilation of prices will, it is understood, be confined to past transactions

Those concerned with the new organization emphatically assert that none of the acts of the institute or of any of its members, committees, officers or directors will in any way impair the utmost liberty of action on the part of all members. Indeed it is stated that a specific provision to this effect has been included in its articles of organization. The work of the institute will begin at once.

The institute was organized under the advice and counsel of Felix H. Levy, of the New York city bar. Mr. Levy, who is the counsel for the new institute, was a special assistant to the Attorney-General in the prosecution of the famous American Tobacco case. Since then, he has been specializing in private practice in anti-trust law matters and has been and is counsel for a large number of trade associations. Mr. Levy is also a member of the Commission on Industrial Inquiry of the National City Federation.

### Election of Officers

The following officers were elected at the organization meetings:

President, R. J. Cullen, Southern Kraft Corporation and Continental Paper and Bag Corporation; Vice-president and chairman of the Paper Division, D. C. Everest, Tomahawk Kraft Paper Company; Vice-president and chairman of the Bag Division, to be selected; Secretary, O. M. Porter; Treasurer, Hugh Wright; Counsel, Felix H. Levy; Executive Committee: President, R. J. Cullen, Southern Kraft Corporation; Chairman, Paper Division, D. C. Everest, Tomahawk Kraft Paper Company; Chairman, Bag Division, to be selected; Alfred Bleyer, Alfred Bleyer and Company; H. L. Brown, Brown Paper Mill Company; F. M. Dickinson, E-Z Opener Bag Company, and representatives of the Continental Illinois Bank and Trust Company and the Chase National Bank, to be appointed.

## International Not to Build Mill in Colorado

It is reported that the International Paper Company has decided not to cover its bid of $5,500,000 for 2,000,000 cords of wood in the San Juan and Rio Grande National Forest of Colorado. Plans and specifications of the proposed news print plant which the International were considering to erect were to have been filed on or before April 5, but as far as can ascertained the company has not taken any steps to comply with the requirements.

Considering that the news print mills in the United States and Canada are only operating at around 59 per cent of rated capacity at present, the International probably has reached the conclusion that the profitable operation of a new plant at the present time would be very problematical. It is also reported that local difficulties were encountered that would have mitigated against the success of the project.

## Norwegian Pulp Production Lower

WASHINGTON, D. C., April 15, 1931—Norwegian production of chemical pulp during the first two months of this year fell 11,250 metric tons or 22 per cent, under that of the corresponding two months of last year according to reports received by the Department of Commerce. The output of both bleached and unbleached sulphite pulp has averaged 10,000 tons per month as against 13,360 tons and 11,585 tons per month respectively last year, while the output of sulphate pulp shows a reduction from an average of 2,220 tons per month to 1,275 tons.

# News Print Institute Sued for $786,695

## Price Bros. & Co., Ltd., of Quebec, Plaintiffs Against Members of Canadian News Print Organization—Breach of Agreement Entered Into By Member Companies for Pooling Orders and Distributing Tonnage Among Mills Concerned, Alleged

[FROM OUR REGULAR CORRESPONDENT]

MONTREAL, Que., April 11, 1931.—Price Bros. & Co., Ltd., of Quebec, have entered an action in the Superior Court at Quebec against the News Print Institute of Canada for $750,000, together with interest amounting to $36,695. The action arises out of an alleged breach of agreement entered into between member companies of the Newsprint Institute of Canada for the pooling of news print orders, and the distribution of tonnage among the mills of the companies concerned. Twelve companies, members of the institute, were named as co-defendants in the case and several other companies were made parties to the action. Price Brothers alleged that the defendant companies owed the News Print Institute varying amounts of money and that the institute in turn was debtor to the claimants for the sum stipulated in the action.

Chief Justice Sir Francis Lemieux presided over the Court, and there was a great array of legal talent when the case came up for hearing. Argument on the opening day was confined to a motion presented on behalf of eleven of the defendants who claimed the case should be transferred to Montreal where the contract in question was signed. Price Brothers' counsel opposed this opinion and the Chief Justice took the matter under advisement.

The amounts stipulated by Price Brothers to be owed by the News Print Institute follow, the companies named being co-defendants of the suit: Abitibi Power and Paper Company, Ltd., $675,615; Bathurst Pulp and Paper Company, Ltd., $39,785; Beaverwood Fibre Company, Ltd., $29,361; J. R. Booth, Ltd., $84,438; E. B. Eddy Company, Ltd., $54.501; Fort Francis Power and Paper Company $276,108; Great Lakes Paper Company, Ltd., $346,658; Kenora Paper Mills, Ltd., $257,334; Lake St. John Pulp and Paper Company, Ltd., $47,677; James Maclaren Company, Ltd., $20,086; St. Lawrence Paper Mills Company, Ltd., $167,838; Thunder Bay Paper Company, Ltd., $4,976.

The following companies are added to the action as mise-en-cause: Anglo-Canadian Pulp and Paper Company; Canada Power and Paper Corporation; Donnacona Pulp and Paper Company, and Port Alfred Pulp and Paper Corporation.

Louis St. Laurent, K.C., of Quebec, represented Price Brothers; O. T. Tindale of Montreal, Anglo-Canadian, Canada Power and Paper, and Bathurst; Aime Geoffrion, K.C., Kenora Paper and Fort Frances Paper; Mitchell, Stairs, Dixon and Senecal for Abitibi and Thunder Bay Paper; Lafleur, Macdougall, Macfarlane and Barclay, Montreal, represent Beaverwood, Lake St. John, Brompton and St. Lawrence; Foran and Foran represented J. R. Booth, Ltd., and E. B. Eddy.

The News Print Institute of Canada was formed as a selling body to handle the output of news print mills and, operating as a pool, to prevent disastrous underselling. Col. John H. Price, president of Price Bros. & Co., was chairman of the Board of Governors of the Institute, but resigned in September last year, making public a letter in which he stated that he was convinced the News Print Institute's claims had been defeated by its own members who did not, he said, conform to their agreement.

### Legislature Discusses News Print Crisis

The session of the Quebec Legislature came to an end during the week with a spirited discussion on the pulp and paper situation, and apparently this situation is to be made one of the keynotes of the Opposition Campaign in the provincial elections which it is expected will take place later in the year. One of the points brought out in the discussion was that despite the depression four of the principal newsprint companies in the Province had made $18,000,000 in profits during the past year.

Maurice Duplessis, Conservative M.L.A. for Three Rivers, the principal paper-making center in the Province, said the Government had been guilty in a great measure for the news print crisis. It had forced the building of mills. A mill had been built at Dolbeau in Lake St. John district, the Government requiring that it have a capacity of over 200 tons of news print per day. Mr. Duplessis said the Opposition believed in giving the industry all necessary protection, but the manner in which the industry had been handled by the Government had meant that mills were closed at Port Alfred, at Beaupre, and at Dolbeau and there had been a drop of about 50 per cent in production. The Government had shown lack of foresight, bringing on a crisis which affected not only the new mills but the old mills. The Government had shown no control in the matter of enlargement of existing mills, and the construction of new mills. He claimed, too, that by orders-in-council the Government had remitted fines incurred by companies for breaking the law as regards cutting, and figured that in the last 10 years a vast sum of money had been lost to the province.

The Hon. Tonore Mercier, Minister of Lands and Forests pointed out that the Government had wished to help the situation throughout the province, and had provided in granting forestry concessions for the construction of three new mills, one on the Gatineau, one at Dolbeau and one in the city of Quebec.

The Government had made concessions to the Ontario Paper Company whereby a mill would be built within a certain time on the Outardos River, but because of the situation had suspended that section of the agreement for the time being. In the meantime, however, the company had gone ahead with its power development. The Dolbeau mills had rendered much service to the north-western part of the Lake St. John district, he said, and it was not in accordance with facts to state that the Government had not known what wood was available for the use of the mill. The forests in question had been surveyed and years before the advent of the mill had been offered at auction, without, however, satisfactory results. He did not believe that the building of this mill, or the others mentioned, had contributed to the crisis as pictured by the member for Three Rivers. There was no crisis in 1926, and there was no over-production.

In 1926, said the minister, Quebec produced 55 per cent of the total Canadian news print production, and in 1930 Quebec's proportion had fallen to 53 per cent, so that did not look as if the forestry concessions made by the Quebec Government were to blame for the crisis. At the time the manufacturers had been warned against the danger, existing mills had immediately increased their production by putting in new and larger machines to a considerable extent.

"My friend of Three Rivers knows that finance must

assume more responsibility than the increase in the machines," said the minister. "This is only my personal opinion, but it is based on facts. There has been much financial manipulation especially in the last two or three years.

"Had it not been for that the industry would have been in a much better situation than it is today. As regards remittances of fines. It is a question of appreciation of the facts. At times we found that certain fines should be remitted, and we did so in full knowledge of the facts, believing that we should do so. It was reported to us that jobbers, especially little jobbers, had been cutting wood below the legal size. We examined each case, and in each case when we found sufficient reason we acted. In some cases, for example, trees had been blown down, and rather than lose the wood, the broken trees had been cut. In such cases we remitted the fines for cutting below the legal size. There are cases where roads have been cut through the forest and necessarily smaller trees have to be cut."

Premier Taschereau reminded Mr. Duplessis that in 1927 the speech from the Throne had repeated the warning to news print manufacturers. However, was the situation so bad? The four principal news print companies of the province had shown profits of $18,000,000 during the past year. It was true there had been too much capitalization, but yet the industry still pays.

Hector Authier, Liberal M.L.A for Abitibi, said one of the troubles had been that companies had clung to the St. Lawrence River instead of getting nearer to their sources of supplies.

Mr. Houde, leader of the Opposition, said there had been over-capitalization, and if the Prime Minister would show the same vigor towards the big capitalists he does in other cases the situation would be better. The profits of $18,000,000 would be sufficient to care for the needs of the real capital invested.

"Where are the main responsible people?" demanded Mr. Houde, and he answered his own question: "Sir Herbert Holt and Mr. Gundy, and there are others. Companies were given enormous areas of forest lines at very low prices, and put millions and millions in their pockets after they capitalized these forests and then it was necessary to have over production to pay the interest on the exaggerated amount of the bonds and privileged stock issued, and perhaps, too, on the common stock. These capitalists are too powerful, though perhaps useful at election times, and the Government has not the courage to tell them to halt. I admit it requires courage."

### Price-Cutting Alleged

During the week there has been a further break in the prices of such stocks as Abitibi, Port Alfred and St. Lawrence, attributed to information from New York that Backus-Brooks interests had cut prices for news print substantially under $50 a ton. According to rumors here, the Minnesota and Ontario Paper Company, which is now in receivership, and which is controlled by the Backus-Brooks interests, is adopting a policy of endeavoring to secure orders at any price, and is offering paper considerably under the market.

### Howard Smith Mills Show Profit

The third annual report of Howard Smith Paper Mills has been presented in consolidated form owing to the large amount of the company's holdings in subsidiary companies and the extent of the latter's assets and liabilities. Comparisons with previous years are therefore not feasible. The net earnings in 1930 totalled $1,231,760. After deduction of combined bond interest and depreciation, there remained a net profit before income tax of $440,706.

This was sufficient to cover preferred dividend requirements on preferred shares of Howard Smith and subsidiary companies paid to the extent $376,564. Howard Smith Mills preferred requirements totalled $270,000. Common dividends paid on the capital stock of a subsidiary company required $6,000 leaving a surplus for the year of $58,142.

The balance sheet reveals a working capital of $2,026,489. Current assets at the end of 1930 totalled $5,168,592 and current liabilities were $3,142,703. The total assets shown in the consolidated report amount to $31,105,113 as against $18,253,306 in the report for the preceding year of Howard Smith Paper Mills. Cash is shown at $211,982 and accounts receivable were $1,155,678.

The consolidated balance sheet shows $2,290,700 of preferred stock of subsidiary companies outstanding and minority stockholders' equity in the common stock and surplus is carried at $724,933. Reserve for depreciation, depletion, totals $979,803.

Capital surplus totals $2,425,315 and earned surplus subject to income tax for 1930, is carried at $1,294,232.

In his remarks to shareholders, Harold Crabtree, president of the company, said in part:

"The world-wide depression in business made the year under review a period of many difficulties. Your company was faced, not only with a reduction in the selling price of many of its products but also with a decrease in the volume of its sales; however, after providing for substantial reductions in the value of merchandise carried on inventory, for depreciation and for the payment of dividends on the preference shares of your company and its subsidiaries, a small surplus was carried forward.

"During the year, your company acquired approximately 965 square miles of spruce pulpwood lands from the government of Ontario, an acquisition of great value. The total area of woodlands held now exceeds 2,000 square miles."

## Amalgamated Paper Co. Busy

[FROM OUR REGULAR CORRESPONDENT]

FORT EDWARD, N. Y., April 14, 1931—Indications of improved business conditions are seen in the decision of officials of the Amalgamated Paper Company to increase production immediately. Announcement was made that orders are being booked more freely and the plant is operating at just about double the capacity of a year ago. The plant is now being operated on full time weekly schedules and a twelve-hour-daily basis and these schedules are to be permanent for some time. Orders now on hand insures the steady operation of the entire plant for several months. New equipment installed during the past month has allowed the productive capacity to be doubled and also resulted in the employment of many new hands. Officials of the company are very optimistic over the outlook and claim that orders are running ahead of last year.

## Power Case Goes to Full Bench

[FROM OUR REGULAR CORRESPONDENT]

BOSTON, Mass., April 14, 1931—The cases of the Holyoke Water Power Company against Whiting & Co., of Holyoke, Inc., have been transferred to the full bench of the Supreme Court on questions of Law by agreement of counsel. The litigation comprises a suit of the Whiting Paper Company against the Holyoke Water Power Company, and his directors for an account of trust funds; a suit of the water power company against the paper company and a suit of the water power company against Whiting & Co., Inc., to prevent the defendants from changing mill power to electricity and supplying current for other than mill power.

# Pennsylvania Paper Mills Slightly Busier

## While Some Plants Are Operating On Full Time, Others Are Working On From Four to Five Day Schedules—Increased Activities Prevailing Are Apparently Due to Seasonal Activities—Wrapping Paper Situation Gradually Improving.

[FROM OUR REGULAR CORRESPONDENT]

PHILADELPHIA, Pa., April 13, 1931.—With reports of March business now completed and summaries of sales throughout that month compiled and recorded as the best for the current year, the trade is looking forward to better times. While March sales were the highest for any month so far this year, they were not sufficient to balance the deficits of January and February, when keen competition and efforts to clean out warehouses from last year's stocks resulted in the lowest quotations for many years, and losses concurrent with such unsettled conditions. Easter sales were fair, although typically in the specialty lines needed for the spring holidays.

Two much disturbed lines of wrapping papers were adjusted to higher values co-incident to the improved spring demand. They were krafts from southern mills and their allied converted products, bags, which were advanced 5 per cent in the past week, making a total of 10 per cent within the two weeks period. Krafts are now selling at 3½ cents f.o.b. mills, less carload freight allowed by some mills, while other manufacturers assume deliveries. Tonnage sales are reported increased by local representatives of southern kraft manufacturers within the month. Whether the rise in prices has been responsible for the improved demand is yet to be determined. It is believed that the usual spring improvement has set in and that this factor has more likely affected volume sales than the rise in prices.

Manufacturers of various lines of paper in the city limits and surroundings report that operations are slightly higher though they do not look for a sustained rise in the schedule of activities, which appear purely seasonal. A few mills are on full time, but the average is from four to five days. While production has been increased, there is greater activity in departmental operations, such as coating, waxing, grease proofing, or in manufacture of containers produced by board manufacturers. Glassine papers are more active but prices are unsteady, and local manufacturers declare there is a need for national stabilizing factors and closer unity of mills in eliminating price cutting and such distressing competition as now witnessed.

Seasonal activity is noted in a few grades of fine paper among distributors, while mill representatives state there has been larger volume orders in book papers from prominent printers and publishers who buy in quantity. Prices are steady. Seasonal demands for announcements, weddings, high grade writing papers and papeteries quicken shipments of these grades. High grade bonds, too, have been livelier.

### Fine Paper Merchants Meet

Fine paper dealers associated with the Philadelphia Paper Trade Association met at the Down Town Club in luncheon session with President W. S. Wilcox in the chair. Owing to the nearness of the holidays the semi-monthly session was given over to informal discussions of business because of the absence of many members on vacation. The next session of the Wrapping Paper Division which will be devoted to reports on the monthly tonnage and business statistics, now, being scheduled for the benefit of wrapping paper stabilization, is to be staged April 22nd, at the Down Town Club. These meetings are aiding in steadying wrapping paper markets.

### Mills Enjoying Greater Demand

Among the Philadelphia manufacturers now engaged in broader operations are the McDowell Paper Mills, in full time on glassines and greaseproof papers; the Dill & Collins Company, which has extended its production on fine papers and has an especially active coating department for its Black and White high grade coated book papers and its Dilfold folding coated grades; the Container Corporation of America, now more active in board and containers; and W. C. Hamilton & Sons, with mills at Miquon, which are engaged on spring orders in larger scale for high grade writings and announcements and allied lines.

### Raymond & McNutt Displays

As sole distributor of the Strathmore Wedding Lines, Raymond & McNutt will feature throughout the territory specially designed window and attractive displays now about to be introduced through these distributors in the Sheridan Building. There are three prices in the spring wedding paper displays, including a large central easel with bride reproduced, and two smaller side easels that will display the lines of Strathmore weddings in engraved specimens. These will be featured by distributors as well as printing and engraving trades.

### Adds K. V. P. Bonds

Raymond & McNutt, fine paper dealers, have added the K. V. P. Bonds in white and colors. The firm has already installed a stock of these in addition to the parchment papers of the K. V. P. lines which formerly were carried. Stocking of the new grades started this week.

### Araba Fly Paper Rolls Distributed

Having acquired national distribution of the Araba Fly Paper Rolls in the United States, R. E. Tongue & Bro., Allegheny avenue and Amber street, are stocking these rolls among the chain stores and among distributors throughout the country. The Araba Fly Rolls are made in patented hanging boxes and are of German manufacture. To date this year the firm has sold 15,000,000 packets.

### Bowling League Line Up

With almost a perfect scoring record, James Lyon, of the Whiting Paper Company's Philadelphia branch, 619 Chestnut street, has placed the Whiting team at the head of the Philadelphia Paper Trade Bowling League. His average score has been 264, with no mistakes to his record. There was keen rivalry in last week's games, as five paper teams were contestants for first place, the honor going to the Whiting Paper Company. Second place in the league is held jointly by the J. R. Howarth Paper Company and the D. L. Ward Company.

### Henry Huquenele In Hospital

Henry Huquenele, secretary of the Huff Paper Company, who has been ill for some time was taken to the Orthopedic Hospital last week for observation. He has been confined to his home for the past month.

### H. L. Joachim Returns

Superintendent H. L. Joachim, of the Container Corpora-

tion of America, who has been in New Orleans, at the bed side of his mother, who has been seriously ill, has returned to his duties at the plant here.

**John Butterworth Succeeds W. R. Kurtz**

John Butterworth, who has been connected with the staff of W. C. Hamilton & Sons, Miquon, fine paper manufacturers, has succeeded Walter R. Kurtz, who has joined the forces of the Schuylkill Paper Company following his resignation from the Hamilton mills. He will take up the duties of assistant manager vacated by the former assistant executive.

**William W. Fitler Dead**

Philadelphia paper dealers long affiliated with the twine branch of the trade, regret the loss of William W. Fitler, veteran twine manufacturer, former president of the Cordage Association of the United States and son of the founder of the Edwin H. Fitler Company, cord manufacturers, at one time Mayor of Philadelphia. In 1875 Mr. Fitler joined his father in the Fitler firm and later became its president. He retired in 1925. He was a member of the Union League, and a director of several large corporations. He was 73 years of age at the time of his passing which followed several months of illness.

**Samuel S. Alcorn Distributes Modern Tissues**

Samuel S. Alcorn, 219 South 5th street, has taken over mill representation for Modern Tissues, made by the Modern Tissue Corporation, New York, including its lines of sanitary products.

## Union Bag Closes Long Island Branch

HUDSON FALLS, N. Y., April 14, 1931—Announcement was made this week that the Long Island City branch of the Union Bag and Paper Company had suspended operations and is now being dismantled. Most of the machinery has already been shipped to other plants controlled by the company where it is understood increased production will result. The plant had an equipment consisting of twenty-two machines and operated on full time until recently. Operations were under the supervision of Jeremia Moynihan, formerly connected with the local plant, who plans to return here in the near future.

Plans are reported under way for increased production at the local plant of the Union Bag and Paper Company where a large number of new workers are to be added. Despite the fact that officials would not confirm the report it was said by those in close touch with activities that increased operations will be made effective in the near future. It is reported that four shifts of workers are to be employed six hours daily instead of three shifts working eight hours. It is said that this step will result in furnishing employment to more men and aid in relieving the unemployment situation in this section. During the past week both paper machines have been operated in full after running on part time during the winter.

## Dr. Schenck on Russian Pulpwood

[FROM OUR REGULAR CORRESPONDENT]

PORTLAND, Ore., April 14, 1931—Dr. C. A. Schenck of Darmstadt, Germany, who spent several weeks in mid-winter lecturing at the University of Montana, before the school of forestry, left March 18 on his return trip. He traveled through the Inland Empire district and south through southern Oregon and by way of California and Colorado on his way east. In discussing the Russian pulp situation Dr. Schenck indicated that Sweden was quite as serious a competitor in American markets as Russia although less notice was taken of this fact by many industrialists.

## Box Production for February

Monthly statistics, covering the period from January 1, 1929 to February 28, 1931, inclusive, on production, shipments, etc., of box board, based on reports submitted to the Bureau of the Census by 97 establishments operating 130 plants, are presented in the following table. The capacity data shown below varies according to the normal number of working days in each month.

| Year and Month | Operation: Inch hours: Capacity | Operation: Inch hours: Operated | Operation: Per cent of Capacity | Production: Short Tons: Capacity | Production: Short Tons: Output | Production: Per cent of Capacity | New Orders: Short Tons | Unfilled Orders (end of month): Short Tons |
|---|---|---|---|---|---|---|---|---|
| 1929 | | | | | | | | |
| Jan. | 12,166,180 | 9,548,914 | 78.5 | 332,202 | 255,795 | 77.0 | 246,126 | 89,643 |
| Feb. | 11,230,320 | 8,661,380 | 77.1 | 306,648 | 233,103 | 76.0 | 233,577 | 89,936 |
| Total 2 Mos. | 23,396,500 | 18,210,294 | 77.8 | 638,850 | 488,898 | 76.5 | 479,703 | ..... |
| March | 12,188,644 | 9,641,580 | 79.1 | 333,424 | 263,252 | 79.0 | 271,118 | 98,016 |
| April | 12,188,644 | 9,495,901 | 77.9 | 333,424 | 256,486 | 76.9 | 254,216 | 99,610 |
| May | 12,188,644 | 9,641,050 | 79.1 | 333,424 | 266,484 | 79.9 | 252,122 | 88,048 |
| June | 11,719,850 | 9,012,771 | 76.9 | 320,600 | 233,164 | 72.7 | 221,429 | 73,330 |
| July | 12,188,644 | 9,227,606 | 75.7 | 333,424 | 242,265 | 72.7 | 245,457 | 76,091 |
| Aug. | 12,657,438 | 9,805,677 | 77.5 | 346,248 | 265,063 | 76.6 | 269,951 | 80,634 |
| Sept. | 11,251,056 | 8,745,015 | 77.7 | 307,776 | 242,032 | 78.6 | 251,189 | 85,866 |
| Oct. | 12,657,438 | 9,707,460 | 76.7 | 346,248 | 269,611 | 77.9 | 269,300 | 84,237 |
| Nov. | 11,681,450 | 8,689,622 | 74.4 | 320,175 | 241,780 | 75.5 | 219,635 | 66,125 |
| Dec. | 11,681,450 | 6,843,974 | 58.6 | 320,175 | 182,699 | 57.1 | 175,090 | 58,612 |
| Total (year) | 143,799,758 | 109,020,950 | 75.8 | 3,933,768 | 2,951,734 | 75.0 | 2,909,210 | ..... |
| 1930 | | | | | | | | |
| Jan. | 11,796,096 | *7,520,155 | 63.8 | 331,968 | *211,691 | 63.8 | *221,782 | *55,744 |
| Feb. | 10,888,704 | 8,971,760 | 82.4 | 306,432 | 220,014 | 71.8 | 213,181 | 62,134 |
| Total 2 Mos. | 22,579,968 | 17,804,333 | 78.9 | 636,060 | 456,358 | 71.7 | 456,793 | ..... |
| March | 11,796,096 | 8,643,344 | 73.3 | 331,968 | 229,979 | 69.3 | 225,782 | 58,591 |
| April | 11,796,096 | 8,580,845 | 72.7 | 331,968 | 245,167 | 73.9 | 249,735 | 66,868 |
| May | 11,796,096 | 8,377,741 | 71.0 | 331,968 | 239,186 | 72.1 | 234,448 | 63,237 |
| June | 11,342,400 | 7,841,532 | 69.1 | 319,200 | 221,525 | 69.4 | 220,965 | 58,866 |
| July | 11,796,096 | 7,892,964 | 66.9 | 331,968 | 222,788 | 67.1 | 230,380 | 65,819 |
| Aug. | 11,796,096 | 8,029,756 | 68.1 | 331,968 | 224,391 | 67.6 | 221,840 | 63,518 |
| Sept. | 11,342,400 | 7,907,075 | 69.7 | 319,200 | 228,257 | 71.5 | 226,899 | 61,978 |
| Oct. | 12,249,792 | 8,391,432 | 68.5 | 344,736 | 253,889 | 73.6 | 247,209 | 57,377 |
| Nov. | 10,888,704 | 7,113,895 | 65.3 | 306,432 | 203,381 | 66.4 | 200,199 | 55,534 |
| Dec. | 11,796,096 | 6,260,675 | 53.1 | 331,968 | 176,483 | 53.2 | 173,258 | 53,622 |
| Total (year) | 139,179,840 | 96,843,592 | 69.6 | 3,917,436 | 2,701,404 | 69.0 | 2,687,508 | ..... |
| 1931 | | | | | | | | |
| Jan. | 11,796,096 | *7,520,155 | 63.8 | 331,968 | *271,691 | 63.8 | *221,782 | *55,744 |
| Feb. | 10,888,704 | 7,344,874 | 67.5 | 306,432 | 205,785 | 67.2 | 198,296 | 50,838 |
| Total 2 Mos. | 22,684,800 | 14,865,029 | 65.5 | 638,400 | 417,476 | 65.4 | 410,078 | ..... |

* Revised.

| Year and Month | Shipments of boxboard: Short Tons | Stocks of boxboard, end of month: Short Tons | Consumption of waste paper: Capacity: Short Tons | Consumption of waste paper: Consumed: Short Tons | Per cent of Capacity | Stocks of waste paper end of month: At plants: Short Tons | Stocks of waste paper end of month: In transit and unshipped purchases: Short Tons |
|---|---|---|---|---|---|---|---|
| 1929 | | | | | | | |
| January | 251,812 | 61,721 | 317,980 | 243,404 | 76.5 | 141,389 | 49,115 |
| February | 233,284 | 61,540 | 293,520 | 222,019 | 75.6 | 130,890 | 54,132 |
| Total (2 mos.) | 485,096 | ..... | 611,500 | 465,423 | 76.1 | ..... | ..... |
| March | 263,038 | 61,754 | 319,046 | 246,660 | 77.3 | 142,026 | 51,531 |
| April | 252,622 | 65,618 | 319,046 | 236,150 | 74.0 | 147,427 | 67,736 |
| May | 263,684 | 68,418 | 319,046 | 249,880 | 78.3 | 150,250 | 53,157 |
| June | 236,147 | 65,435 | 306,775 | 232,060 | 75.6 | 156,352 | 55,543 |
| July | 242,696 | 65,004 | 319,046 | 214,574 | 67.3 | 170,745 | 62,967 |
| August | 265,408 | 64,659 | 331,317 | 256,339 | 77.4 | 171,218 | 59,480 |
| September | 245,957 | 60,734 | 294,504 | 231,029 | 78.4 | 175,279 | 87,700 |
| October | 270,929 | 59,416 | 331,317 | 254,163 | 76.7 | 186,806 | 70,020 |
| November | 237,747 | 63,449 | 306,725 | 230,046 | 75.0 | 193,534 | 51,650 |
| December | 182,603 | 63,545 | 306,725 | 172,336 | 56.2 | 197,841 | 49,012 |
| Total (year) | 2,945,927 | ..... | 3,765,047 | 2,788,660 | 74.1 | ..... | ..... |
| 1930 | | | | | | | |
| January | 232,284 | 67,605 | 318,786 | 223,288 | 70.0 | 180,055 | 54,142 |
| February | 220,987 | 66,632 | 296,429 | 216,717 | 73.1 | 179,497 | 54,577 |
| Total (2 mos.) | 453,271 | ..... | 615,215 | 440,005 | 71.5 | ..... | ..... |
| March | 229,325 | 67,286 | 321,126 | 229,909 | 71.6 | 192,957 | 54,629 |
| April | 241,458 | 70,995 | 321,126 | 230,993 | 71.9 | 181,125 | 51,950 |
| May | 238,079 | 72,102 | 321,126 | 232,581 | 72.4 | 185,972 | 34,919 |
| June | 225,336 | 68,291 | 308,775 | 210,793 | 68.3 | 184,451 | 38,241 |
| July | 223,427 | 67,652 | 321,126 | 207,596 | 64.6 | 175,645 | 43,393 |
| August | 224,141 | 67,902 | 321,126 | 215,879 | 67.2 | 187,508 | 36,108 |
| September | 228,439 | 67,720 | 308,775 | 223,071 | 72.2 | 165,499 | 45,960 |
| October | 251,810 | 69,799 | 333,477 | 228,588 | 68.5 | 177,486 | 34,910 |
| November | 202,042 | 71,138 | 296,429 | 190,502 | 64.3 | 184,598 | 30,649 |
| December | 175,170 | 72,451 | 321,126 | 162,528 | 50.6 | 201,597 | 34,292 |
| Total (year) | 2,692,498 | ..... | 3,789,427 | 2,572,445 | 67.9 | ..... | ..... |
| 1931 | | | | | | | |
| January | *209,660 | *74,482 | 321,126 | *199,229 | *62.0 | *197,699 | *34,510 |
| February | 203,202 | 77,065 | 296,429 | 191,331 | 64.5 | 191,507 | 35,229 |
| Total (2 mos.) | 412,862 | ..... | 617,555 | 390,560 | 63.2 | ..... | ..... |

* Revised.

# Fort William Opening Sought By Government

## Premier Henry, In Toronto, States Resumption of Operations At Abitibi Mill Has Been Requested—International Brotherhood of Papermakers Sponsors Petition—Rapid Progress Being Made On Big Power Development At Abitibi Canyon

[FROM OUR REGULAR CORRESPONDENT]

TORONTO, April 13, 1931—That the Ontario Government is seeeking to have the Abitibi mill at Fort William re-opened was the statement given out by Premier Henry in Toronto this week. The Premier stated that the Government had received a petition from Fort William, sponsored by the International Brotherhood of Papermakers, asking that the necessary steps be taken "to secure the reopening of the Abitibi mill, the alternative being the immediate cancellation of the limits in the District of Thunder Bay held by the Abitibi Power and Paper Company." "I don't think cancellation will be necessary," remarked the Premier. The Government was endeavoring to have the mill reopened, he said. The feasibility of such a step, however, was largely a matter of markets. The petition of the Papermakers Union carried the names of 2,500 citizens. The petition also asks for a statement of particulars of all timber limits disposed of since 1916 and of the conditions imposed upon the lessees. It says: "We make this request not in any spirit of criticism of the present Government, but upon the principle that the natural resources of this district, of which timber is the most important, belong to the people of this district and that the people, therefore, are entitled rightly to know how their assets are being handled.

Accompanying the petition was a letter from the International Brotherhood of Papermakers to Premier Henry, stating that more than three months had elapsed since he had held out hopes of partial operation of the mill and the employes had been reduced to a pitiable condition. The letter asserts that "mishandling of timber resources has affected every lakehead business interest. The letter also alleges that the Abitibi company deliberately turned down orders for news print and endeavored to hold up the price of paper by artificial means, resulting in a loss of markets and widespread unemployment and suffering for their employees. The Premier has replied promising consideration of the petition.

### Protecting Ontario's Pulpwood

Thunder Bay's fire-ranging district will be covered with a system of steel look out towers within the next few years, in an effort to thoroughly protect the pulpwood lands, if the policy of the Forestry Branch to build a number of towers each year is continued. Two towers were constructed this winter, one at Garden Lake and one at Pakashkan Lake. All the steel for these and three other towers which it is proposed to erect this summer if the fire season permits, was carried into the sites during the winter by aeroplane. Other locations of towers virtually ready to be set up are at Obonga Lake, Conmee Junction and Upsala. Later on towers will be located at Kashabowie, Whitefish Lake, Hurkett, Susie Lake on the Nipigon River, and Jackfish Island on Lake Nipigon. It is expected that eventually the rest of this territory will be dotted with the 80-foot towers, from which a view of twenty-five miles or more may be obtained.

### New Manager for Hinde & Dauch

L. F. Winchell has been appointed acting general manager of Hinde & Dauch Paper Company, Ltd., head office Toronto, and will assume his new duties immediately. This announcement was made a few days ago by the board of directors, following their adoption of a resolution granting O. H. Moore, general manager, an extended leave of absence owing to his ill health. It is understood that Mr. Moore will spend the summer in Europe. Mr. Winchell has had eighteen years' experience in the paper and box business in the United States, having been general sales manager of the River Raison Paper Company of Munroe, Mich. Mr. Moore relinquishes the post of general manager after years of faithful and efficient service with the company, who are manufacturers of board and paper boxes.

### Abitibi Canyon Hive of Activity

A community of 1,900 workmen, exclusive of a few women and children, is now established at the big canyon on the Abitibi River between Cochrane and the Moose River, from which is directed the big power development being carried out by a subsidiary company of Abitibi Power and Paper Company. Development of future power at this point is responsible for the employment of this number of men on the work of constructing a dam for producing 275,000 hp. Last summer the high cliffs on either side were covered with trees, but since then acres of land have been stripped of the forest growth and the big canyon is now the scene of considerable engineering activity. When the work is completed hundreds of acres will be covered with water and an electric plant will have been built for the distribution of electric power. The Provincial Hydro has already contracted to take 100,000 hp. to supply various Northern Ontario centers, Sudbury being the largest. At the Abitibi development there are a hospital, school, movie picture theatre and a community hall.

### London Firm Expands in Halifax

Lawson & Jones, Ltd., folding paper box manufacturers, London, Ont., are building a new factory in Halifax, N. S., for the manufacture of corrugated fiber shipping containers. About five years ago they purchased a controlling interest in an established printing and lithographing business in Halifax, known as the Royal Print and Litho Company, Ltd. Since that time they have enlarged the building considerably and have developed other lines of paper products. The new plant they are erecting will operate under the management of the Royal Print and Litho Company, and will be known as the Maritime Paper Products, Ltd. They have purchased an acre of land on the railway siding in Halifax and have let contracts for the first unit of the factory. This will cover about 20,000 square feet. Lawson & Jones expect to have the factory ready for operation by May 15. The machinery and equipment is mainly of United States manufacture, but materials used will be all Canadian and the greater part will be manufactured in the Maritime Provinces.

### Notes and Jottings of the Trade

E. A. Mateer, assistant to C. V. Hodder, secretary of the Canadian Paper Box Manufacturers' Association, Toronto, received word of the death of his mother in Belfast, Ireland, and sailed for the British Isles a few days ago. He will be gone about six weeks.

The Ontario Paper Company, at Thorold, Ont., opened

tenders for erection of a machine shop unit, and contract has been let. This is a unit of a $500,000 expansion program, of which $92,000 is for construction. Art A. Syhmoom is general manager of the Thorold plant, which is controlled by the *Chicago Tribune*.

Canadian Comstock Company, Ltd., has announced the appointment of C. C. Rathgeb as vice-president and managing director. Mr. Rathgeb has been a member of the organization since 1910 and has been associated with some of the largest electrical installations in Canada. He is well known in the paper industry, having supervised the electrical installations in a number of the paper mills.

D. L. McLeod, mill manager of the Ontario Paper Company, at Thorold, Ont., and chairman of the technical section of the Canadian Pulp and Paper Association, has returned from a business trip to Montreal.

The Toronto paper trade was interested in the announcement that Col. C. H. L. Jones, president of the Mersey Paper Company, Brooklyn, N. S., had been elected a member of the board of directors of the Liverpool Board of Trade.

## Boston Paper Market More Buoyant

[FROM OUR REGULAR CORRESPONDENT]

BOSTON, Mass., April 13,1931—Improvement in the paper market as a whole continues, so that many wholesalers and manufacturers' representatives are more optimistic. Gains are gradual, but dealers are hopeful that they are permanent and undoubtedly the majority, at least, prefer a steady increase of business rather than a sudden spurt or boom, frequently followed by a reaction.

There is more interest in fine papers. The volume of sales has been sustained, with possibly an increase in some quarters, and there is a brighter prospect, according to reports in the trade. Some dealers report a very good business. Among the lines mentioned as moving at least fairly well are book papers, envelopes, box coverings and greeting card materials.

The demand for wrapping paper, more evident in the last few weeks, continues to improve; some say it is "much better," others a "little better." The outlook is brighter. The majority say a fair business has been transacted. A prominent dealer intimates that his business so far in April is above that of March for the corresponding period, and only a little below that for the same period a year ago. The kraft market is strengthening more pronouncedly than for a considerable time, and a manufacturers' representative says that further increases can be looked for in the near future. "The last rise," he says, "can be carried off in better shape than for some time." Paper bags are strengthening likewise. Specialties are moving fairly well.

The box board market is slightly better, with at least a fair demand as a whole. Prices are sustained. Paper stock remains dull and devoid of feature, with mills buying for bare requirements only. Prices are unmoved.

## J. & W. Jolly in Receivership

[FROM OUR REGULAR CORRESPONDENT]

HOLYOKE, Mass., April 14, 1931—J. & W. Jolly, Inc., local foundry and water wheel manufacturers were petitioned into receivership last week, the plaintiffs being J. Russell & Co., Inc., and the Merrick Lumber Company. Martin L. Cramer, treasurer of the concern said that the concern was solvent but it was hampered by lack of working capital and frozen receivables. He said that assets were $387,958 and the liabilities, $231,117. The Company was established in 1881. At present 40 men have been working on part time. The court will consider the petition Thursday of this week.

## Enrollment Increases at Forestry School

[FROM OUR REGULAR CORRESPONDENT]

SYRACUSE, N. Y., April 14, 1931—It was learned this week that fifty-two students from all sections of the country are enrolled at the New York State Ranger College located near Cranberry Lake for the class of 1932. Courses were started under the new schedule early last month. Dean Hugh P. Baker is head of the New York State College of Forestry at Syracuse University and the Ranger School is conducted as a branch. A new building was recently completed at Cranberry Lake and many hardships formerly encountered by students have been eliminated. Before this structure was built the Ranger School was compelled to dispense its classes in the winter because of the poor housing conditions but under existing conditions the course now continues from March to February.

Students at the Ranger School are given extensive training in field work and the fundamentals of forestry which includes forest engineering, growing of forest trees, cruising of timber properties and protection of forest against fire. The course is entirely separate from the forestry courses conducted at the State College in Syracuse. The training of rangers is carried on to fill the gap between professionel foresters and the lumberjack and only a limited number of students are accepted upon furnishing satisfactory credentials regarding their ability to carry on the work. James F. Dubuar is now director of the school.

Announcement is also made of the appointment of Dean Hugh P. Baker to membership in the Norteastern Forest Research Council for a term of four years. The appointment was made by the United States Agricultural Department. The council is an advisory body working in conjunction with the director of the northeast forest experiment station at Amherst, Mass., on forest research problems. The station covers the territory embracing the New England States and is directing center for all research in that section by the federal forest service. It is now carrying on a schedule of forest studies involving hundreds of projects.

## Norwegian Mills Declare Lockout

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., April 14, 1931—The entire Norwegian paper and pulp industry was involved in the lockout declared effective March 14 according to a report to the Department of Commerce from Commercial Attache M. H. Lund, at Oslo.

The immediate cause of the lockout was the renewal of wage agreements which have been in effect for several years. Workers are insisting on a 42-hour week and compensation for the reduced working time. They also want practically all of the provisions in the previous agreement revised. The employers in turn want a 15 per cent reduction in wages and the privilege of adjusting wages to the cost of living index. Most of the mills have large stocks on hand and the lock-out may not affect shipments for some time. Norwegian producers who joined the sulphite cartel will have the present shut down credited against the agreed 15 per cent reduction in their output.

Commercial Attache Lund at Oslo reports a strengthening in the price of sulphite pulp, which was anticipated following the curtailment of output by 15 per cent, has not yet materialized, but at the same time there has been no further decline in prices. The full effect of the reduction in output will hardly be felt, he states, until accumulated stocks have been absorbed, which may take several months. Some encouragement may be felt, however, the report states, in the fact that the bottom of prices seems to have been reached.

# I. P. Shows Deficit of $3,496,513 for 1930

The 1930 annual report of the International Paper and Power Company shows consolidated earnings, after deducting all interest and other charges senior to dividends on the preferred shares of the Company but before deducting depreciation, amounted to $12,695,668. Total dividend payments on the shares of the Company amounted to $7,703,037 leaving a balance before depreciation of $4,992,630. Depreciation charges (the rate of which was reduced as of July 1, 1930) amounted to $8,489,143, resulting in a deficit for the year of $3,496,513.

The consolidated earnings before depreciation of $12,695,668 for 1930 are slightly less than the $13,151,264 shown on the same basis in 1929. As a consequence, however, of the reduction in the rate of depreciation consolidated earnings after depreciation were slightly higher than in 1929, standing at $4,206,524 as against $4,011,762. The expected growth in earnings from the Company's Canadian power developments was realized substantially in full and the anticipated increase in efficiency of paper mill operations was surpassed, but the increases in income resulting from these factors were offset by the adverse effect of the depression on the volume of the Company's business and on the prices of pulp and of most grades of paper.

**Summarized Statement**

The following is a summarized statement:

| | 1930 | 1929 |
|---|---|---|
| Earnings available for depreciation and dividends on I. P. & P. Co. stocks | $12,695,668 | $13,151,264 |
| Earnings after depreciation available for dividends on I. P. & P. Co. stocks | 4,206,524 | 4,011,762 |

While the earnings during the first three quarters were not sufficient to cover the preferred dividend payments plus the amount set aside on the books for depreciation, the net earnings for the fourth quarter showed a marked increase. This was due in part to increases in contract deliveries by Candaian power subsidiaries, in part to continued improvement in manufacturing efficiency, and in part to savings in administration expenses effected during the latter part of the year.

During the year net additions to fixed properties amounted to $43,930,253 (of which $27,283,033 was on power and utility properties); and $5,354,075 of subsidiary company bonds and other obligations were retired through the operation of sinking funds and small maturities. Due to unsatisfactory conditions existing throughout the year in security markets, no new financing was undertaken except for note and debenture issues of New England Power Association. Proceeds of such new financing amounted to approximately $28,700,000. The balance of funds required for the above capital additions and the additional working capital needed in the operations of the properties were obtained from earnings and from bank loans.

The consolidated balance sheet at the end of the year showed notes payable totaling $25,885,450 of which $6,605,450 represented debt of New England Power Association.. Net current assets exceeded $38,500,000 and the ratio of current assets to current liabilities was a little under two for one. If New England Power Association figures are eliminated, the ratio of current assets to current liabilities is greater than two for one. Current assets are carried at conservative figures; finished newsprint, for instance, at $30 a ton at the mill—less than sixty per cent of the selling price. Wood inventories at newsprint mills normally rise in periods of declining business since a year's wood supply must usually be cut from at least six to eighteen months in advance of the time it is to be used. In spite of this fact the expansion of inventories during the year has been relatively slight and presents no serious problems.

**The Outlook**

The report states: "As stated in the last annual report, the extensive pulp and paper development program initiated by the International Paper Company in 1925 was substantially completed during 1929. Since the end of that year the two mills not then completed—the news print mill at Dalhousie, New Brunswick, and the kraft mill at Panama City, Florida—have been placed in operation.

"The adverse business conditions under which operations of the Company were carried on during the last year emphasize the benefits which are being increasingly realized from the diversification of operations and the concentration of production at low cost modern mills which the completion of this development program has made possible. No substantial further capital expenditures for pulp and paper properties are now contemplated.

"Due in part to the additional low cost paper-making capacity now available at the two new mills and in part to further increase in operating efficiency at mills already in operation, manufacturing costs for 1931 should show further substantial decreases. In addition administration expenses are being reduced. The effect of these reductions began to be reflected in earnings about the first of October and their full effect is not yet evident. During 1931 the Company will also benefit from the large increase in contract power deliveries by Canadian Hydro-Electric Corporation, Limited, since October 1, 1930, and from the further increases which will take place on October 1, 1931.

"On the other hand, the severe decline in volume of sales, both of the pulp and paper properties and of New England Power Association, which took place in the last six months of 1930, is still substantially unrelieved by any definite upward trend and it is not yet clear that its adverse effect on prices has been exhausted."

## Zimmer Paper Products Co.

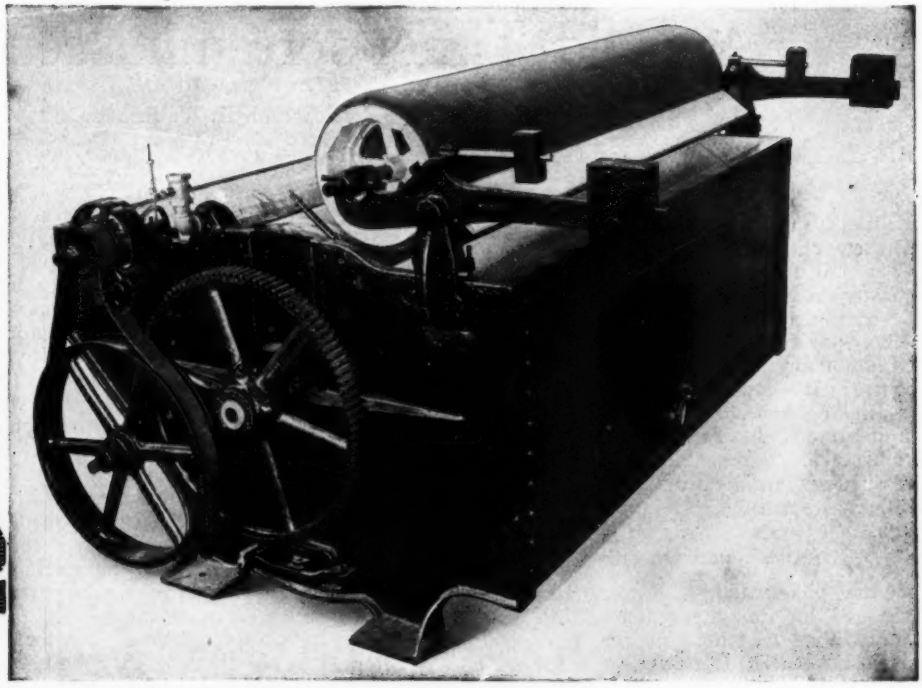
[FROM OUR REGULAR CORRESPONDENT]

INDIANAPOLIS, Ind., April 13, 1931—In an article written some time ago concerning the Zimmer Paper Products Company of Indianapolis, members of waxed papers principally for the bakery trade, a mistake was made in the spelling of the name, it appearing in the magazine as "Aimmer Paper Products Company." That's what happens with the touch system of typewriting and failure to read copy after it is written. Officials of the company stated Saturday that they had many inquiries as a result of the article in THE PAPER TRADE JOURNAL and they apparently all reached the right place even with the misspelled name.

## Dilts Machine Works Gets Cup

A beautiful silver cup standing fiteen inches high adorns the mantle in one of the offices of the Dilts Machine Works Inc., Fulton, N. Y. This cup has been awarded, "In recognition of achievement in accident prevention to the management and employees of Dilts Machine Works by the Utica Mutual Insurance Company." It represents freedom of lost-time accidents for the six months period ending March 1, 1931.

This enviable record in the Dilts shops is an impressive endorsement of the character, personnel and management of the Dilts organization.



BIRD MACHINERY

# Here is a SIMPLE closed system that WORKS

**From start to finish, the Bird Closed System is a common-sense, simple system. It is simple to install, simple to operate, simple to maintain. Yet its efficiency is as high as the most elaborate system ever devised.**

**The Bird System's combination of simplicity and efficiency, along with its low cost, makes it the most profitable system you can install. Let us submit a layout and an estimate for your mill.**

**BIRD MACHINE COMPANY**
**South Walpole .. Massachusetts**

# BIRD CLOSED SYSTEM

4801

# An Old Timer's Reminiscences

By Joseph H. Wallace, Pres., Joseph H. Wallace & Co.

*(Concluded from last week)*

### After the War!

We used to think Germany was the most governed nation, whether it was the best governed or not. That was Pre-war and Pre-Volstead. Laws in Germany covered practically every act of life and death. At Furstenwalde works of Pintsch Company, the workingman received beside their pay twenty tickets per day for beer. On being asked how many they used, my guide exclaimed "twenty, of course! It's expected of them." I didn't blame them after drinking some of it, but if "it was expected of *me*" it's a question if that fact alone wouldn't make me a prohibitionist. Muenchener, however, might keep me a wet. It was better than any I've had since, even including the home brew we make, which is good if we can keep it long enough.

### Didn't Like the Kaiser's Looks

One day while calling at Kaiserhof Hotel in Berlin, the Kaiser and his daughter came within six feet of us. Arthur Millington told a policeman that he didn't like the Kaiser's looks! It always surprised me as day after day passed and Millington still kept out of jail. I continually found all sorts of articles collecting in my bags and bundles.

### Fibers and the Possibilities

The closing of our London office early in the war resulted in our devoting more time to study of fibers and their possibilities and our laboratory and miniature sulphate mill had developed into the most practical experimental plant we had seen. Operating this little mill for these years at the plant of Southern Paper Company, Moss Point, Mississippi, had resulted in a pretty good calibration by which the results obtained could be measured closely in mill terms. Greenwood and Stevens had become proficient operators with the experience of tests for the War Department and some of the facts developed were found to have value in peace time operations. The force was augmented by several other good men, among them William F. Burleigh a chemist who graduated with my class at Worcester Polytechnic Institute, and who had made a study of resins, and other non-cellulose matter contained in Southern woods.

### By-Products from Southern Pine

During 1919 to 1925 we undertook to interest capital in manufacturing turpentine, pine oil and rosin as by-products to paper made from Southern pine woods. Also in producing white papers of quality from these woods but to no avail. It appeared that the bell cow having made kraft all the cows will make kraft and nothing else from the Southern pine woods until another bell cow develops. At an operating paper mill in 1919 and 1920 we produced magazine book of high character from Southern woods, and certain publishers tried the paper and pronounced it O. K. Certain manufacturers of naval stores (turpentine, pine oil and rosin) from Southern pine woods, though seeking for advice as to making paper from the spent chips after extraction, were skeptical when we tried to persuade them that paper possibilities should dominate the operation.

### White Papers from Southern Woods

Our "Story of Pine Waste" has so far been wasted. *But,* we predict that white papers of a high grade will be made from Southern woods and that by-products will pay for the wood delivered into the digester and that these chips (already extracted) will be not only the best chips ever used for chemical pulp, but will be the ***only uniform*** or *standardized* wood material the industry ever has had. Then and only then will chemical pulp be uniform in character and technical control, a fact. These remarks have been made by others smarter than we are, and we believe them. We long for the time when from each ton of wood from cut-over lands extraction plants will produce $20.00 worth of by-products as well as $30.00 worth of paper. It will be done and we hope to live to see it. Some big men in the industry told us in 1908 that we were crazy to expect to see kraft paper made from Southern wood. We are still crazy and enjoy it too!

Meantime, mill engineering has been very enjoyable, reports for financing in particular, laboratory work has been the most fascinating, *but* rearrangement of existing plants is the most fun there is, and calls for more real original thought than building new mills—which needs courage and a lot of money.

### Making and Selling Papers

From 1925 to 1930 inclusive most of our time and all of our capital was involved in paper mill operation and sales of paper, and we are ready to acknowledge that we do not intend to discuss that subject for several reasons:—

(1) These reminiscences are supposed to be pleasant ones for you and for me—that's one reason!

(2) It's too recent, anyway, for either of us to look back far enough on it to get a bird's eye view without an eye strain or a headache.

(3) We are afraid some low comedian will call it *Nightmares* instead of *Reminiscences.*

So we will pass to 1931 with the above remarks and a long sigh of relief like that of an old German we heard of. His wife had been greeting him every evening with her fears of Gretchen's morality. One night she exclaimed, "Gretchen is in trouble!" "Thank God, that's over!" was his answer; and so say we all of us!

### A Book That Would Be Worth While

P.S. Why don't you old time paper makers send in reminiscences? If you have been in the paper business twenty-five years you are eligible. We might get up a book that would be worth while if we all pushed. Address: Joseph H. Wallace, Care Black-Clawson Company, Hamilton, Ohio. This is our Swan Song at Temple Court Building, New York City where we have been located (when home) for exactly 30 years. We want to see what we can do with paper mill equipment.

THE END

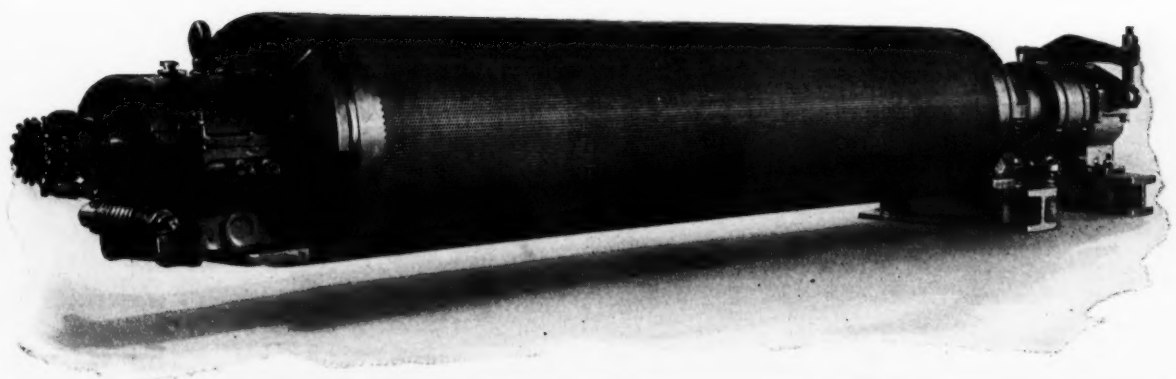
## Scandinavian Pulp Markets Quiet

WASHINGTON, D. C., April 15, 1931—The Scandinavian pulp markets are generally quiet at the present time according to reports received here. In the sulphite market prices have generally been steady since the first of the year, and while there have been no increases on the other hand reductions have also ceased. The Swedish sulphate market is extremely dull, sales for 1932 depending in most instances on readjustments in 1930 contracts.

# CANTILEVER

Downingtown Suction Rolls are built in both Cantilever and Standard Types, with suction pump connection on either front or rear. All rolls are fully adjustable while running. This includes the packing strip adjustment, deckle adjustment and adjustment of angular position of the suction box. Furthermore, when the roll is idle, the packing strips can be removed through ports in the end heads, without removing the suction box, or dismantling the roll in any way. A complete description of the Downingtown Suction Roll and its advantages is contained in our Catalog 103. Write us for a copy and a list of concerns using this improved type of suction roll.

**DOWNINGTOWN MFG. CO.**
**DOWNINGTOWN, PA.**



# another notable installation of

Aerial view of the Crown-Willamette Paper Company's mill at Camas, Washington. Engineers—V. D. Simons, Chicago.

# for Crown Willamette

From the raw materials to a wide variety of complete consumers products is the notable manufacturing achievement made possible by the new facilities and equipment of the Crown-Willamette Paper Company mill at Camas, Washington. Production capacity is now around 400 tons per day devoted largely to the manufacture of the widely advertised Zee and Zalo tissues, fancy sulphate and kraft wrapping papers, towels and napkins. This is one of the largest single mills operating on the Pacific Coast and recent additions represent one of the most noteworthy developments in the entire industry.

Prominent among the many extensive additions to buildings and equipment are the three new paper machines, including the new No. 10 Yankee machine and the new bleaching system. To assure proper handling of the important ventilating and exhaust requirements in connection with the new equipment, Ross apparatus was specified—adding another notable Ross installation to an already impressive list.

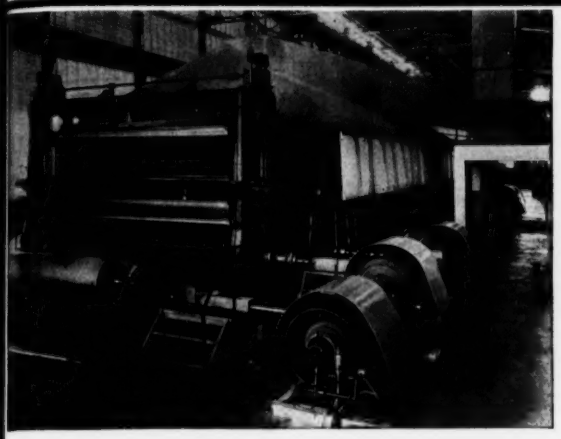
Equipment designed and installed by Ross engineers in the Camas mill includes Heating and Ventilating apparatus, Calender Cooling and Exhaust Systems and supplementary heating equipment for converting buildings.

## J. O. ROSS ENGINEERING CORPORATION

## ROSS SYSTEMS — ROSS

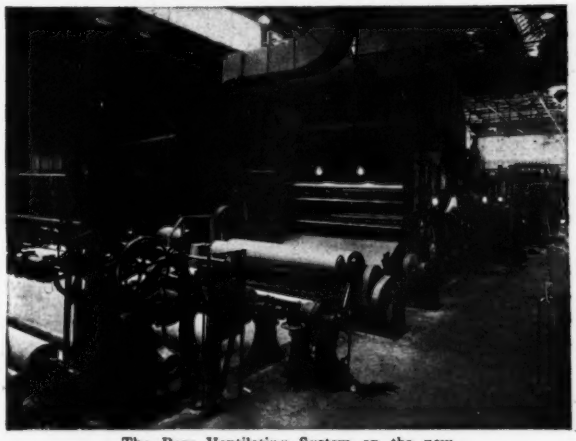
IN CANADA — ROSS ENGINEERING OF

# ROSS EQUIPMENT

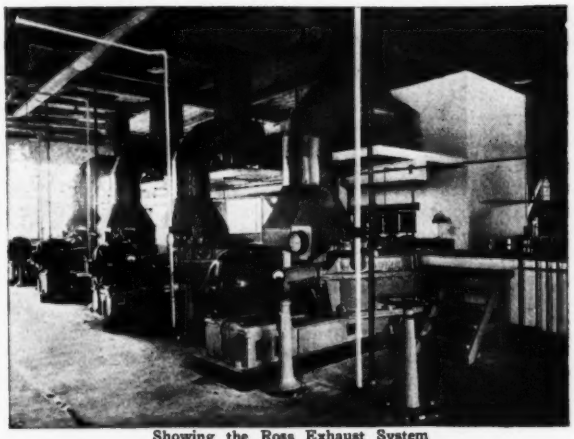


The Ross Ventilating and Exhaust System on the new No. 11 paper machine.

Another view of the No. 11 machine showing the Ross System of Exhaust and Ventilation.



The Ross Ventilating System on the new No. 10 Yankee machine in the Camas mill.



Showing the Ross Exhaust System installed in the new Bleach plant.

## Paper Co.

It is significant that practically the same type of Ross equipment that was previously supplied for the older machines in this mill was again specified for the new machines with a specially constructed hood and exhaust system for the new Yankee machine. A complete modern exhaust system was supplied to fully meet the requirements in the new bleach room. In fact, this extensive and noteworthy new development at Camas, Washington, furnishes another outstanding example of the important part that Ross equipment plays in the most prominent mills—from Coast to Coast.

**Chicago Ill.** **New York N. Y.** **Portland Ore.**

## SYSTEMS

## OF CANADA, LIMITED

# CONSTRUCTION NEWS

*A Summary of Vital Facts Regarding Construction, Finances and Operation of Paper Mills*

## Construction News

**Northbridge, Mass.**—The Kupfer Brothers Company, Northbridge, manufacturer of coated and fancy paper stocks, is considering a new addition to mill in the Riverdale district, to be one-story, reported to cost over $45,000, with equipment. It is understood that work will be placed under way at an early date.

**Camas, Wash.**—The Crown-Willamette Paper Company, San Francisco, Cal., has completed the expansion and modernization program which has been in progress at its Camas mill for the past 24 months, and has converted the plant from a news print unit to a mill for production of tissue and other special paper stocks. The program is said to represent an investment of close to $4,000,000, with equipment. The plant has been continued in service during the remodeling and development work, and will hold to a capacity schedule with full working quota for an indefinite period.

**Sandusky, Ohio**—The Sandusky Folding Box Corporation, Sandusky, recently organized with a capital of $25,000, plans operation of a local plant for the manufacture of folding paper boxes and other containers. The new company is headed by Frank H. Myers and Henry K. Gassan, both of Sandusky. It will be represented by Claude J. Minor, Sandusky.

**Millis, Mass.**—The Safepack Mills, Inc., Millis, manufacturer of waterproof paper stocks, etc., affiliated with the Ruberoid Company, 95 Madison Avenue, New York, is planning rebuilding of portion of plant damaged by fire, April 9, with loss reported at close to $50,000, including building, equipment and stock.

**Fall River, Mass.**—The Champion Paper Box Corporation, recently organized by Emanuel M. Jaffe, 155 Girard street, Brooklyn, N. Y., and associates, has leased local property for proposed new paper box manufacturing plant. Equipment will be installed at once. It is expected to give employment to an initial working force of over 150 persons. Benjamin H. Whitestone, Fall River, will be president; Mr. Jaffe is treasurer.

**Seattle, Wash.**—In connection with its new plant at Seattle, on which work has been started, the Bates Valve Bag Company, 60 East 42nd street, New York, will complete its expansion program on the Pacific Coast, which has been in progress for some months past. The new Seattle mill will be one-story, 140 x 148 feet, brick and steel type, and will be equipped for the manufacture of heavy duty paper bags for building material such as cement, plaster, lime, etc., with an initial production basis of about 150,000 bag units daily. Kraft papers from Pacific Coast mills will be utilized for manufacture. The Austin Company, Seattle, has been awarded the general construction contract for the plant, which is reported to cost close to $100,000, with machinery. The company is a subsidiary of the St. Regis Paper Company, Norfolk, N. Y. Seattle headquarters are in the Pacific Northwest Building.

**Monroe, Mich.**—The Monroe Paper Products Company, Monroe, has arranged plans for a corporate reorganization, and is planning for the sale of new stock in amount of $120,000, for general financing and development.

**Providence, R. I.**—The Gardner Paper Company, Providence, has arranged for a change in company capital from $100,000 to 100 shares of stock, no par value.

**Holyoke, Mass.**—The O'Connell-Quirk Paper Company, Holyoke, recently organized with capital of 50,000, is reported planning operation of a local paper converting plant for production of a line of paper specialties, and will also deal in general paper stocks. Edward P. O'Connell is president, and Thomas E. Quirk, 30 Main street, Holyoke, treasurer and representative.

**International Falls, Minn.**—Production is being continued at the local mill of the Minnesota & Ontario Paper Company, and it is proposed to hold to the present manufacturing schedule for an indefinite period. The company is said to have orders on hand for the output. E. W. Backus, E. W. Decker and Charles Fowler, Minneapolis, Minn., recently appointed receivers in an equity action against the company, have been named ancillary receivers by the Federal Court. Mr. Backus is president of the company.

**Pittsburgh, Pa.**—The D. J. Rex Box Company, Boyd and Locust streets, manufacturer of paper boxes and containers, has awarded a general contract to W. J. Payne, 87 Beltzhoover avenue, for the rebuilding of portion of factory recently destroyed by fire, estimated to cost close to $75,000, including new equipment to be installed.

**Trenton, N. J.**—In connection with expansion program now under way at the local plant of the Panelyte Corporation, Enterprise avenue, the company is arranging for considerable increase in output to supply new markets for its insulating board products; it is said that considerable business has been secured in that line. Superstructure is in progress on a one-story extension, 50 x 160 feet, reported to cost about $50,000, with equipment. J. H. Kelleher, 5362 Arlington street, Philadelphia, Pa., is general contractor. The company is a subsidiary of the St. Regis Paper Company, Norfolk, N. Y.

**Terre Haute, Ind.**—The corrugated container manufacturing unit of the Turner Brothers Glass Corporation Terre Haute, used for the manufacture of boxes for glassware distribution, has been included in a sale of the properties at a public auction, to W. H. Mandeville, Elmira, N. Y. The purchaser will form a new company at once, under the name of the General Glass Corporation, capitalized at $500,000, to take over and operate the plant, including the box-manufacturing division. H. C. Mandeville,

Elmira, and I. J. Collins, Terre Haute, will be identified with the new organization, which will begin production at an early date.

**Chelsea, Mass.**—The Standard Box Company has been organized with a capital of $250,000, to take over and expand the company of the same name, specializing in the production of paper boxes and containers, with plant at 28 Gerrish avenue. The new company is headed by William B. Hirshon, president; Nathan Singer, vice-president, and others. The first noted will also act as treasurer.

**Dalhousie, New Brunswick**—The New Brunswick International Paper Company, Dalhousie, a subsidiary of the International Paper Company, New York, has resumed full production at its local news print mill on a basis of about 850 tons daily, following a curtailment for several weeks owing to lack of power for mill operations. It is expected to hold to the capacity schedule for an indefinite period.

**Toledo, Ohio**—The Toledo Blue Print and Paper Company has been formed under state laws with capital of 250 shares of stock, no par value, to take over and expand local company of the same name, with headquarters in the Produce Exchange Building. Incorporators of the new organization include Harry J. Detzler and Joseph M. Schiebel.

## Paper Men in Salvation Army Drive

Harold R. Hopkins of the Oxford Paper Company, 250 Park avenue, has accepted the chairmanship of the paper manufacturers and dealers division and Herman H. Hess of Hess & Densen, 129 West 20th Street, has accepted the chairmanship of the paper box manufacturer's division for the 1931 maintenance campaign of the Salvation Army in which $528,000 will be sought for the support of the 52 permanent centers of the Army's work in Greater New York. The campaign will take place May 18th to June 1st, with Edward F. Hutton as general chairman.

Mr. Hopkins and Mr. Hess have both served as chairmen in previous years. They are enthusiastic supporters of the Salvation Army drives.

The center of the Salvation Army's work in Greater New York include hotels and shelters for men and women, employment bureaus, aid for discharged prisoners, day nurseries, orphanages, family welfare work, fresh air camps and many other branches of welfare and religious work. Funds raised by the Salvation Army during the past winter were wholly for emergency relief and did not provide the maintenance of these regular activities.

Major Robert L. Gray, president of the Gray Envelope Manufacturing Company, 55-33rd Street, Brooklyn, has accepted the chairmanship of the paper division for the Brooklyn section of the 1931 annual maintenance campaign of the Salvation Army in which $528,000 will be sought for the support of the 52 permanent centers of the Army's work in Greater New York. The campaign will take place May 18th to June 1st, with Edward F. Hutton as general chairman. Brooklyn's quota in this campaign is $50,000.

## No Wage Change at St. Regis Mills

ALBANY, N. Y., April 14, 1931—Announcement made by the officials of the International Brotherhood of Papermakers this week revealed that no revision in wages and working conditions in the mills of the St. Regis Paper Company are contemplated. The company operates mills at Norfolk, Norwood, Deferiet, Raymondville, Herrings and Harrisville, employing several hundred workers. A continuation clause exists in the agreement between the union organization and the St. Regis Company.

## Demand More Active in Indianapolis

[FROM OUR REGULAR CORRESPONDENT]

INDIANAPOLIS, Ind., April 13, 1931—Paper business in most all lines is showing a little more life here. Business is far from rushing, but it is probable April of this year will show an increase over the same month last year.

Much of the activity is coming from the specialty manufacturers. Their demand for all sorts of stock is increasing. The coming of the picnic season has done much to increase this business, particularly for tissues, waxed papers and paper plates and cups. Dealers are beginning to lay in their early spring stocks.

Demand for roofing and building paper continues off, even with the coming of spring. Dealers generally have low stocks, but they are delaying their buying until the trend of the building season can be more accurately determined.

There is a fair demand for wrapping paper and kraft, though the volume is below that of 1929. The first four months of this year should show a slight improvement over last year, however.

The fine paper market shows some activity though the volume is not what would be considered entirely satisfactory. Stocks are in good shape among the local jobbing houses and a fair spring business is expected. The coming of spring has livened up the print paper market a trifle. The last two weeks have seen an increase in volume used and the month is well ahead of last year.

Karl R. Zimmer, president of the Zimmer Paper Products Company here, was out of the city last week on business. He is expected to return tomorrow or the day following.

## Johnston & Son Pulp Mill Burned

[FROM OUR REGULAR CORRESPONDENT]

CRANBERRY LAKE, N. Y., April 14, 1921—The pulp wood mill in this village owned by Johnston & Son, of Port Leyden, was completely destroyed by fire this week with a loss estimated at $15,000. The company has filled many contracts for the International Paper Company and the destruction of its plant will interfere with its future plans to some extent. It was learned that nearly 50,000 cords of pulpwood lying at the head waters of the lake cannot be handled until the plant is remodeled. The origin of the fire could not be learned but it is rumored that carelessness of lumberjacks may have started it. The plant operates by electricity, hauling pulpwood from the lake and cutting it into lengths for shipment to the International Paper Company and other paper mills. A portion of the equipment was damaged. Officials of the company announced that the rebuilding process would be started immediately.

## Dinner Tendered James Salter

James Salter, superintendent of the Victoria Paper Mills Company, Fulton, N. Y., resigned his position as General Superintendent on April 1, after seventeen years of service. To show their appreciation for his faithful services, the office and the heads of the different departments tendered him a dinner at the Citizen's Club, Wednesday evening, April 1. President Forsythe made a very appropriate address, after which he presented Mr. Salter with a purse of gold and an appreciative address from the officials and employees of the company. Mr. Salter thanked them for their kindness.

Mr. Salter left for New York to spend a few days with his life long friend, G. T. Matthews, tea importer. He sailed on the M. S. Bermuda, on Saturday, April 11, for Bermuda, where he will spend a few weeks. He will then return home after a much needed rest.

# POWER PLANT SECTION

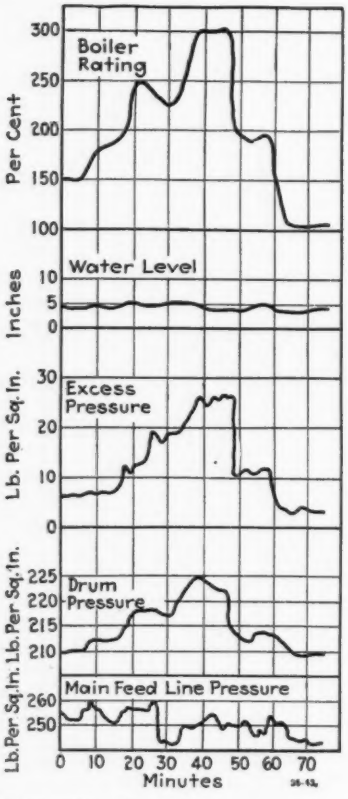
## REDUCING POWER COSTS THROUGH UNIT TREATMENT

*Conducted by* **Reginald Trautschold Consulting Engineer**

# Automatic Feed Water Regulation

### Pump Controls and Feed Water Supply

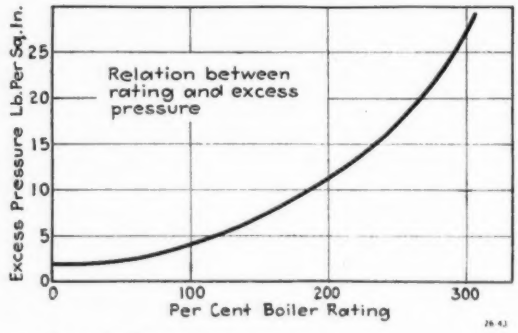
Modern boiler plant operation; the practice of driving boilers at high ratings, high furnace temperatures and with little water storage space; has brought the boiler feed water problem very much to the fore. There is much greater need for sensitive water level adjustment and this can no longer be entrusted to the hand control methods relied upon in the past, when boilers were very much more apt to be operated at or near constant ratings and variations in load were quite customarily met by banking or cutting in additional boilers. Constant excess pressure, the pressure differential between the feed pump discharge and the steam header, no longer suffices, furthermore, for with the large variations in rating practiced by the modern, efficient school of combustion an excess pressure is demanded that varies with the rating at which the boiler is operated.




*Courtesy: Smoot Engineering Corp.*

FIG. 1.

**Operating results with feed water control on 625 hp. pulverized coal fired boiler.**




*Courtesy: Smoot Engineering Corp.*

FIG. 2.

**Relation between boiler rating and excess pressure.**

This is because water level regulators functioning on constant excess pressure tend to carry a lower water level with an increase in rating, which is, obviously, not only a hazardous practice in these days of high and fluctuating rates of steam generation, but is apt to lower boiler efficiencies 5 to 15 per cent. As the rate of steaming in a boiler increases and steam temperatures rise, the pressure drop due to frictional resistance in superheaters, etc. and the variation in feed line friction between the pump and the boiler inlet also increase. The result is a higher steam drum pressure and, consequently, a smaller excess pressure at the boiler inlet, even though the excess pressure at the pump may remain the same. Since it is the difference between the feed water pressure and the steam pressure at the boiler drum which causes the feed to enter the boiler, the necessary excess pressure for satisfactorily replenishing the boiler varies to some extent with the boiler rating.

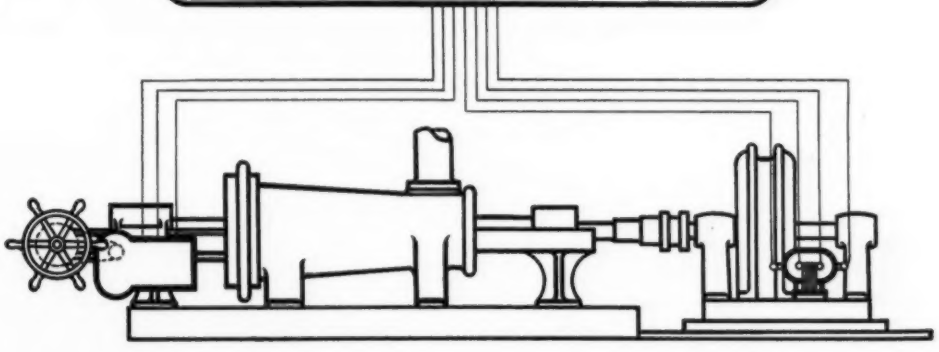
#### Balanced Water Supply

A definite relationship exists between the required excess pressure and the boiler rating, in fact, and this is dependent, naturally, upon the rate of flow, or quantity, of water entering the boiler. For a properly balanced water supply, one which will maintain a satisfactorily constant water level in the boiler at any rate of steam generation, the quantity of

ENTIRELY AUTOMATIC CONTROL OF STOCK HYDRATION

# LEWELLEN JORDAN CONTROL

CAN BE APPLIED TO ANY MOTOR DRIVEN JORDAN



## A Control System For Automatically Maintaining UNIFORM HYDRATION OF PAPER STOCK FIBRES

**It maintains uniform hydration of the stock fibres by continuously adjusting the Jordan plug to compensate for any variation in the stock as it comes to the Jordan.**

**A description of the Lewellen Jordan Control will be found in the news section of this issue of the Paper Trade Journal.**
**Our special Jordan Control Catalog containing complete description of this latest Lewellen control has been mailed to every paper mill in the United States and Canada. If you did not receive your copy, or if you desire additional copies, or other information, ask for Catalog No. 30-J.**

## LEWELLEN MANUFACTURING COMPANY
### COLUMBUS, INDIANA, U. S. A.

*Makers of*

*Lewellen Variable Speed Transmission.*
*Lewellen Automatic Paper Weight Control.*
*Harvey Lewellen Automatic Paper Thickness Control.*
*Lewellen Automatic Paper Cut Off Control, operated by Photo-Electric Cell.*
*Lewellen Automatic Control for Veneer Lathe, Winders, etc.*
*Lewellen Automatic Control for Textile Range Finishing Machinery.*

feed water admitted should vary as the square root of the excess pressure. That is, if the required quantity of water doubles, the excess pressure should be increased four times, or, in general, the excess pressure should increase as the square of the rating.

By varying the excess pressure in this manner, the feed having been made proportional to the amount of steam generated, it is possible to use the customary types of feed water regulators successfully, since the excess pressure adjustment cares for the major part of the regulation and the water level regulator is called upon simply to refine the adjustment. The excess pressure regulator in any one position corresponds to a fixed orifice and by varying the pressure across this valve, with the square of the rating, the supply of feed water is made equal in weight to the amount of steam generated.

While such regulation should provide all necessary control, if there are no marked variations in rate of steam generation, the boiler water level will vary during radical and sudden fluctuations in rating, on account of the differing volumes of steam in the boiler tubes. This makes it advisable to employ a water level regulator in conjunction with the excess pressure regulator, the refinement eliminating the human element entirely and insuring virtually constant water level under all conditions of operation.

Just how successfully such a system of feed water control and regulation actually functions is strikingly brought out in the accompanying chart, depicting graphically the operating data secured during a test run on a 625-horsepower, pulverized coal fired boiler. Despite the marked and sudden changes in rate of steam generation, *i.e.*, in rating fluctuations, the regulation of the feed water supply was such that the water level was maintained substantially constant, whether the boiler was functioning at 100 or 300 per cent of rating. The increase in excess pressure with the rate of steaming necessary to secure such close control of the water level is very apparent as is also the increase in drum pressure with the boiler load, the latter making necessary the increase in excess pressure in order to maintain the required difference in pressures, between that of the feed water supply and that of the boiler drum.

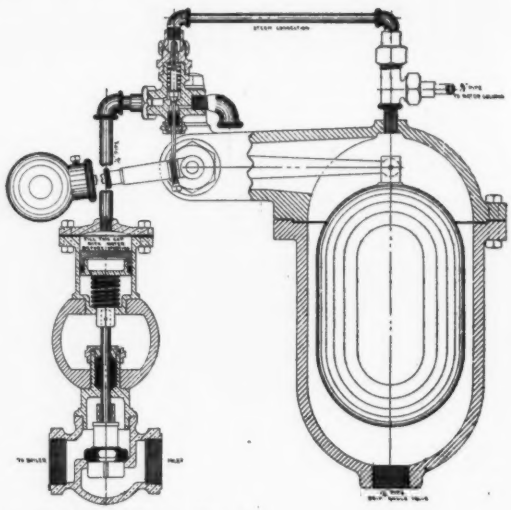
An interesting side light brought out by this data is that the main feed line pressure, which was not under regulator control, varied considerably during the test run. Such fluctuations had to be compensated for by the excess pressure regulator, or control, as well as the increased demands imposed by elevations in rate of steaming. The flatness of the water level graph shows plainly the efficacy with which the control is exercised by proportioning the excess pressure to the square of the rating, the water level remaining at approximatly the same height at all ratings. Had the excess pressure been maintained simply constant, it is quite apparent that the water level would have varied with the rate of boiler steaming and dangerous conditions would have been created during the periods of most intensive steam generation.

The loading of the excess pressure control may be secured in various ways, by the boiler draft drop, forced draft fans or any squared function of the boiler operation may be employed to balance the excess pressure. Where boiler feed pumps are driven by constant speed motors, the regulation

*Courtesy: Northern Equipment Co.*

FIG. 3.

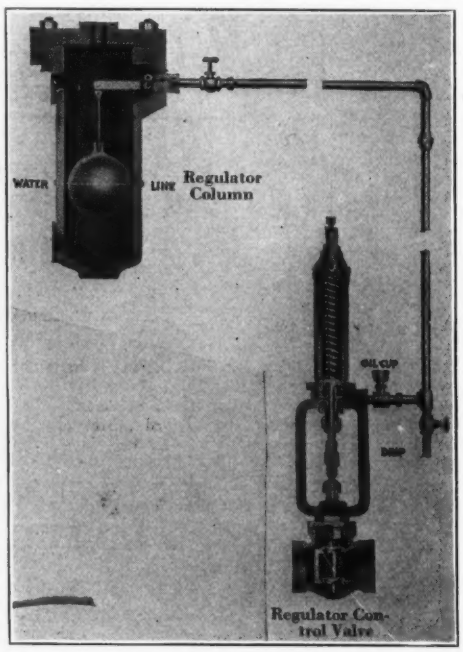
**Automatic feed water regulator for holding water level between fixed limits, utilizing expansion and contraction of heavy matallic tube.**



*Courtesy: The Chaplin-Fulton Mfg. Co.*

FIG. 4.

**Feed water regulator utilizing principle of displacement.**




*Courtesy: Wright-Austin Co.*

FIG. 5.

**Feed water regulator employing the float principle.**

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*of the*

PAPER & ALLIED TRADES

CORRECTED UP TO DATE

*The 56th Consecutive Annual Edition*

**THE OLDEST INDUSTRIAL DIRECTORY IN THE UNITED STATES**

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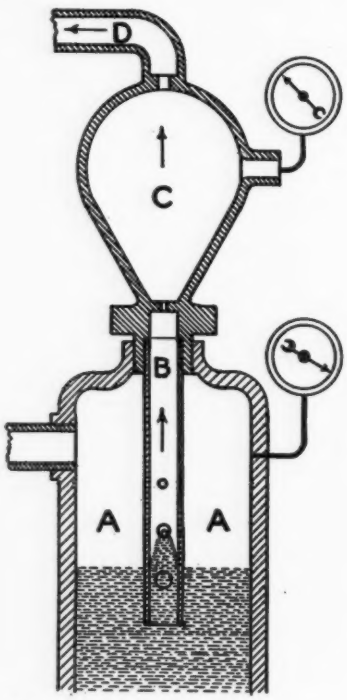
may be secured by a valve in the pump discharge. If the pump is turbine driven, or if a variable speed motor is used, the regulator will vary the speed of the turbine or motor so as to create the required excess pressure to balance the loading.

Where the battery of steam generators consists of only a few boilers operated at about the same rating and the line resistance is not great, it is usually sufficient to control the excess pressure at the pumps, depending upon water level regulators to care for the discrepancies in line resistance. On the other hand, if the boiler plant consists of many boilers, with groups of boilers operated at different ratings, or if there are boilers of different sizes, operated on different systems of firing, it is necessary that the regulators be individual to the boilers, with separate controls on the pumps, creating an excess pressure variation somewhat greater than the maximum, required, boiler excess pressure. Such arrangement insures the protection of the boilers operated at the lower ratings, by the individual excess pressure regulators, and permits the operation of the various boilers being maintained at individually high efficiences. Where groups of boilers are operated at different pressures, a station master controller is installed.

**Installation at the Champion Coated Paper Co.**[1]

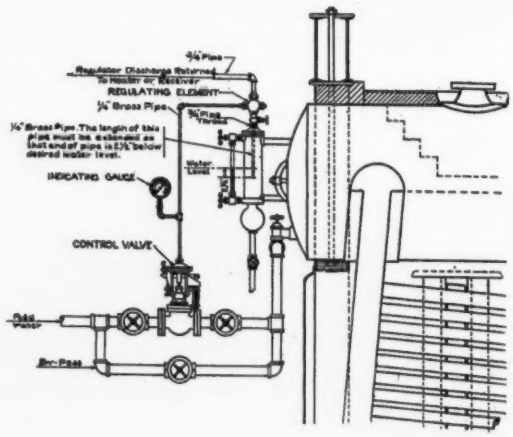
While the foregoing outline pertains largely to one particular method, or system, of approved feed water regulation, it is sufficiently general to be indicative, as well, of advanced practices, as typified by the most successful among the modern systems of automatic boiler feed control. A brief description of the feed water regulation equipment installed at the Hamilton, O., plant of the Champion Coated Paper Company, consequently, should be very pertinent, for this particular example is representative of what may be termed another efficient system of feed water regulation and one well meeting the exacting requirements of the modern high pressure steam plant.

[1] Data supplied by The Swartwout Co.




*Courtesy: Atlas Valve Co.*

FIG. 6.
**Detail of regulating element mounted upon water column**



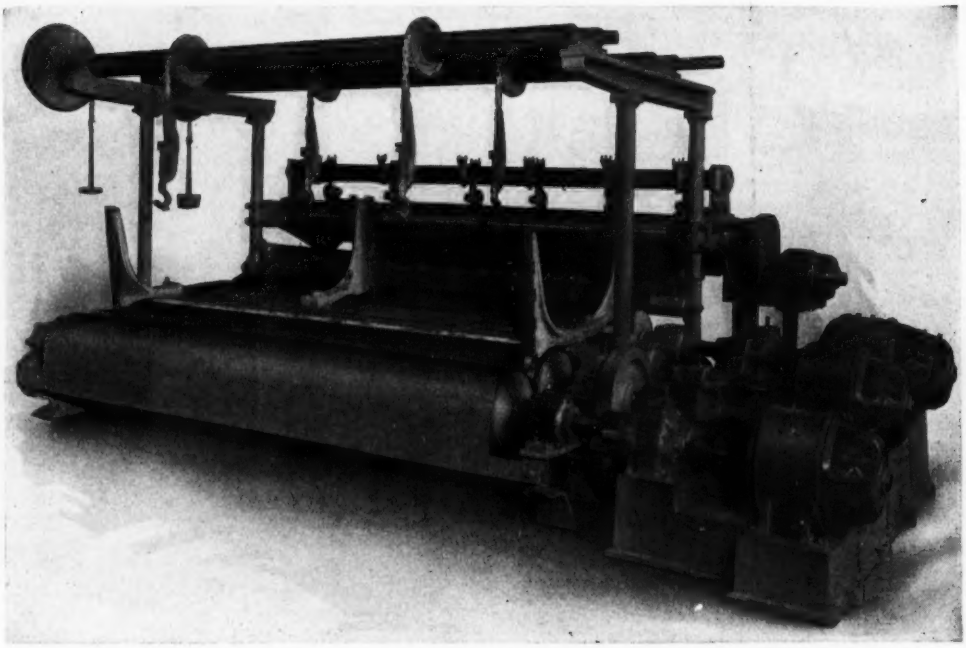

*Courtesy: Atlas Valve Co.*

FIG. 7.
**Typical feed control installation showing assembly of regulating element on water column and control valve in feed water line.**

An appreciation of this installation is facilitated, incidentally, by a brief reference to the boiler plant prior to the installation of the automatic system of feed water regulation. So it may be well to mention that a battery of several boilers generating steam at a pressure of about 150 pounds formerly served the mills, supplying steam for process requirements and a portion of the mills' power needs, the latter through the operation of a low pressure steam turbine. The balance of the power required was, at that time, purchased from the local public service company. This arrangement was not entirely satisfactory, so to reduce power costs and to generate steam more economically this battery of old boilers has now been ripped out and a single, highly efficient, high pressure boiler substituted. The rating of this new boiler is 350,000 pounds of steam per hour, maximum, at 650 pounds per square inch working pressure, with the steam superheated to a temperature of 750 degrees Fahrenheit. A new high pressure turbine has been installed, the exhaust from which is utilized for the operation of the old low pressure turbine, transforming the plant into one which not only well meets all requirements for steam and power, but one which is looked upon as about the most modern and efficient of paper mill power plants.

The system of feed water regulation in question is that caring for the needs of this remodeled power plant and consists of both pump control and the feed water regulation. The pump equipment includes one constant speed, motor driven, centrifugal pump delivering water at a pressure of 710 pounds per square inch and two turbine driven pumps which serve as standbys. The steam supply for the two turbine pumps is controlled by two master control, or throttle valves and these valves are arranged so that one opens ahead of the other and the second one delays opening until the turbine served by the first valve attains full speed. Incidentally, the steam turbines are equipped with speed limiting governors and the master control operating the two control valves is itself controlled by the pressure in the pump header.

A three-way pilot valve is installed in the intermediate pressure line connecting the master control with the diaphragms of the two throttle valves. The diaphragm of this multi-passage valve is connected into the discharge line from the motor driven pump, between the pump and the check valve, and the valve is so installed that, so long as its diaphragm is under 710 pounds pressure, the intermediate



The counter-weighted lifting hooks are required only to equalize soft ends, not to reduce roll hardness.

# The M & W Electric Drive Is SAFER

***Yes, we still build belt-driven Winders — and good ones! But we consider the Electric Drive a long step forward.***

THE primary reason for using the M & W Electric Drive for winders is that it winds better rolls. But safety is important too.

Safety inspectors are quick to notice the improvement as between this compact group of electric motors, driving the winder drums through speed reducers and couplings, and the conditions with older types of drive. Not only safety, but floor space and cost of maintenance are conserved by using electric drive.

With M & W Electric Drive, lower cost and better product go with safety. Cost of winding is reduced because operating and maintenance costs are reduced. The need for skilled supervision is far less, and the risk of winding too hard or too soft is virtually eliminated. The product is better, more uniform and more saleable.

Ask for the new Winder Bulletin, and consider how much your own winding conditions might be improved by the accurate automatic control afforded by the M & W Electric Drive.

**THE MOORE & WHITE COMPANY**
*Established 1885*
**PAPER MACHINE BUILDERS**
15TH ST. & LEHIGH AVE. PHILADELPHIA, PA.

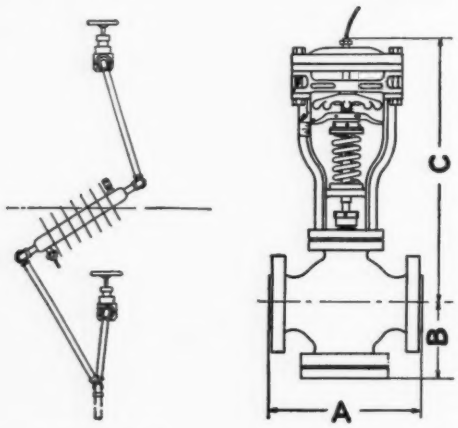
pressure from the master control is cut off from the throttle valves and the intermediate pressure steam, at from 115 to 175 pounds pressure, is passed through the pilot valve and holds both throttle valves closed. Under such conditions the motor driven pump alone functions, normally discharging at a pressure of 710 pounds per square inch, but if this constant speed pump should stop or its delivery pressure drop to 700 pounds, the pilot valve at once functions, connecting the control valves to the master control. Bringing the control valves into service, first starts one of the turbine driven feed pumps and then, if more than the capacity of this one pump is required, the second turbine pump automatically cuts in and runs just fast enough to maintain the required pressure.

The boiler itself is fed through two lines, one to each end of the drum, and both a feed water regulator and an excess pressure valve are placed in each of these lines. This combination operates so efficiently that the water level in the boiler does not vary more than 1½ inches. In fact, the feed pump control has worked out so successfully that the motor driven pump can actually be cut out and the turbine pumps will start and pick up the feed load so promptly that no noticeable interruption occurs in feeding the boiler. Furthermore, if the motor driven pump is again brought into service, the supplementary turbine pumps automatically shut down or adjust themselves to the lighter duty of maintaining the necessary balanced water supply.

The total investment entailed for the equipment in this sensitive and effective system of feed water regulation was approximately $4,700.00 and the savings realized, as compared with hand control methods, include the avoidance of the need of employing a water tender and another man in the pump room. This saving in payroll burden alone represents an annual return on the investment of at least 300 per cent. In addition, there are important intangible economies attributable to proper and constant control of the boiler feeding, apparent in steadier streaming and higher boiler efficiency, which are difficult to appraise with any accuracy. These savings, so hard to compute in dollars and cents, are known to exist, however, and to be very considerable.

### Pump Controls and Regulators

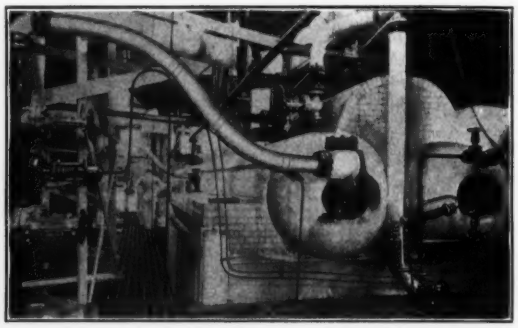
These systems of feed water regulation for modern high pressure boiler plants presuppose an adequate supply of properly heated feed water, of course, the correct regulation and control of which entails the use of mechanisms for governing both the pressure of the feed pump discharge




*Courtesy: The Swartwout Co.*

FIG. 8.

**Pressure regulator with radiator-type water jacket and regulator valve.**



*Courtesy: Bailey Meter Co.*

FIG. 9.

**Feed water regulator installation at the plant of the Maine Seaboard Paper Co., Bucksport, Me.**

and the sensitive adjustment of boiler water level. In fact, virtually all systems of water replenishment for modern boilers entail the use of these devices, whether the required excess pressure for the injection of the feed is maintained constant or is varied with the rating, as is found desirable when high and fluctuating rates of steam generation are necessary.

Unless these devices are employed, the boiler furnace, even with the most sensitive of combustion regulation, cannot adjust itself sufficiently rapidly to load conditions when there are marked variations in steam demands. A sudden increase in load, for example, tends to create a drop in boiler pressure with the resulting release of heat stored in the water. This heat, in the form of steam bubbles, causes the water level to rise; hence the need of a properly designed regulator to cut down temporarily the amount of feed water admitted to the boiler, until combustion activity is readjusted or the load decreases. Similarly, if the load drops off suddenly, the feed valve should be opened by the regulator to admit more water to absorb the excess heat being generated by the boiler furnace.

The pump controls governing the main feed line pressure need hardly be enlarged upon, however, for they simply entail the proper use of diaphragm or piston valves controlled by the differential in pressure between the steam and the feed main. The differential may be made effective through counterweights, springs, liquid, air or steam pressures, etc., but in any case the mechanism employed is a complete unit and may be so considered.

In the case of feed water regulators for the sensitive adjustment of water level in the boiler, the principles entailed differ sufficiently to justify a few words concerning the operation of some of the ingenious devices and arrangements which are on the market at the present time. These comments, however, are not to be regarded in the light of advocating the use of only the few types of feed water regulators which can be mentioned here, since the remarks are intended only to familiarize the reader with the operating principles of a few of the feed water regulators worthy of his consideration.

One of these is actuated by the expansion and contraction of a relatively heavy metallic tube mounted in an inclined position on a rigid base and connected by a lever to a control valve in the feed line. This inclined tube is mounted so that the proper water level in the boiler is about on a line with the central portion of the tube, the upper end of which is connected to a steam and the lower end to a water space in the boiler, much like a tilted water column. The water level in the expansion tube thus corresponds with the water level in the boiler. The temperature

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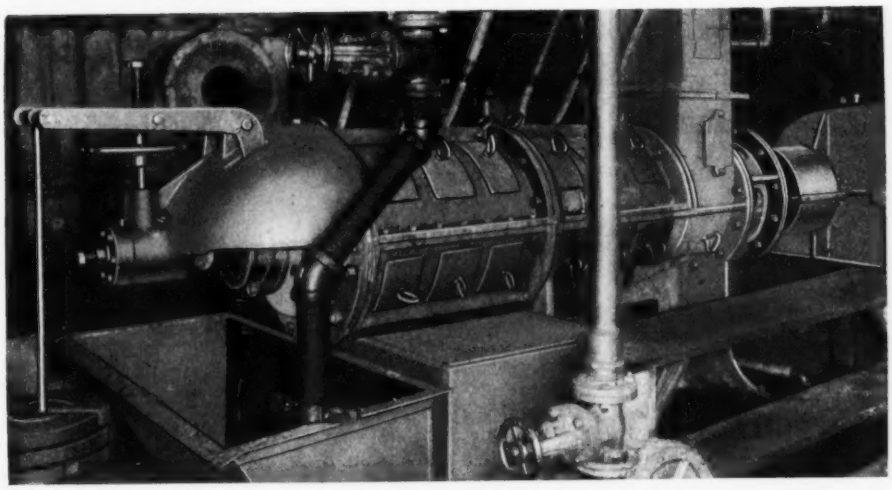

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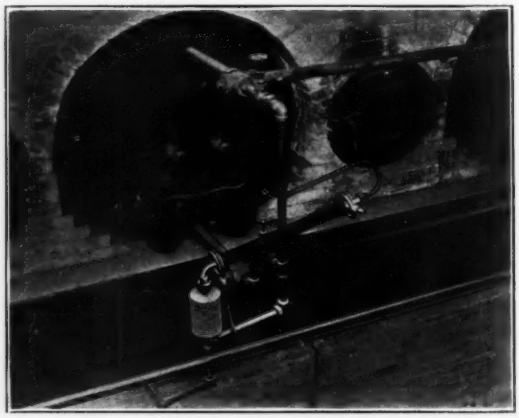
of the water in the expansion tube is only slightly above that of the boiler room, however, due to its being cooled effectively by radiation. On the other hand, the end of the tube supplied with steam from the boiler is, of course, quite hot, so that any elevation of the water level in the tube and boiler, due to excessive boiler feeding, brings about a shortening of the tube and a decrease in the amount of feed valve opening. A drop in boiler water level has just the opposite effect, naturally, the expansion of the inclined tube cutting down the opening of the feed valve and reducing the rate of feed.

Another type of feed water regulator makes use of a counter-balanced displacement weight which rises and falls in an ingenious manner in a hooded chamber in conformity with variations in the water level in the boiler. Incidentally, this particular arrangement was one of the very first systems of automatic regulation of water supply to a steam boiler and the unit is still built substantially as it was when first developed more than a third of a century ago.

The hooded chamber in which, and to which, is attached the operating mechanism of the regulator is connected at its top to the water column of the boiler, at the middle gauge cock opening, in such a way that when the water level in the boiler is above normal, the chamber fills with water. A weight, or displacement body, is suspended in this chamber and is attached to the end of a counter-weighted lever and balanced so that the exterior counterweight raises the displacement body when the chamber is filled with water and allows the displacement body to sink in the chamber when its water content is displaced by steam from the boiler, which occurs when the boiler water level is reduced. This "see-saw" action of the lever is utilized to manipulate the boiler feed controlling valve, admitting more water to the boiler when the water level is low and reducing the rate of feed when it is high.

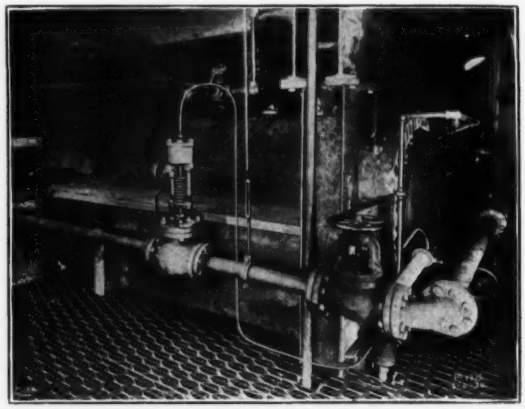
In still another device for the automatic regulation of the boiler feed water supply, the control of the actuating, regulating steam pressure is exercised by a float in a regulator column connected top and bottom with steam and water spaces of the boiler. This float rides on the water in the regulator column, on a level with the water in the boiler, and is connected by a rod and link to a control valve, which, on a drop in water level in the boiler, automatically applies steam pressure to a piston-operated, regulator, feed control valve. This regulator valve then opens and admits more water to the boiler, until the water level in the boiler and



*Courtesy: Bailey Meter Co.*

FIG. 10.

**Feed water regulating system serving 500 hp. stoker fired boiler operated at a pressure of 125 pounds, illustrating the simplicity of connecting the pressure regulator to the boiler drum.**



*Courtesy: Bailey Meter Co.*

FIG. 11.

**Feed water regulator caring for 500 hp. stoker fired boiler, showing the pressure generator connection to the boiler drum covering the control valve in the feed water main.**

column rises sufficiently to shut off the steam supply to the regulator valve, by virtue of the rise of the float in the regulator column. The cutting down of the steam supply to the control valve in this manner automatically relieves the pressure on the piston of the valve and the rate of feed is reduced.

### Regulating Element on Water Column

A distinctive feed water regulator, of simple construction and operating on novel principles, has a regulating pressure element mounted directly on the water column of the boiler and vented through a discharge pipe to the heater, receiver or hot well where the pressure is comparatively low, atmospheric or only slightly higher. An open sampling tube extends down from the hollow, bulbous chamber of the regulating element to somewhat below the normal water level in the boiler and water column. This tube has several small holes through its shell near its lower end, usually three, with the center one at about the correct water level of the boiler. An inlet port connects the sampling tube with the pressure chamber of the element and an outlet port of somewhat larger diameter joins the chamber with the discharge pipe. A third connection from the element chamber leads to a diaphragm, spring balanced, control valve in the boiler's feed line.

When the water in the boiler is low, the holes in the sampling tube are all out of water and only dry steam passes up into the element pressure chamber, in which the steam expands with considerable loss in pressure. The steam escapes freely furthermore, through the outlet port to the discharge pipe with the result that the pressure transmitted to the diaphragm of the feed control valve, through the connection from the element chamber to the valve, is insufficient to offset the opening of the feed control valve by its adjusting spring, with the result that there is a full feed water flow to the boiler.

As the water level in the boiler and water column rises, the end of the sampling tube submerges, the water creeps up slightly in the sampling tube, and the steam passing into the sampling tube through the holes still above the level of the water carries with it some of the water into the element pressure chamber, where, due to the conditions of lower pressure and temperature pertaining, some of the water entrained in the steam evaporates. The effect, aided by increased resistance to the escape of the wet steam at the outlet port orifice, is that the pressure in the element pressure chamber gradually piles up and, similarly, the pressure exerted by the steam against the diaphragm of the feed gov-

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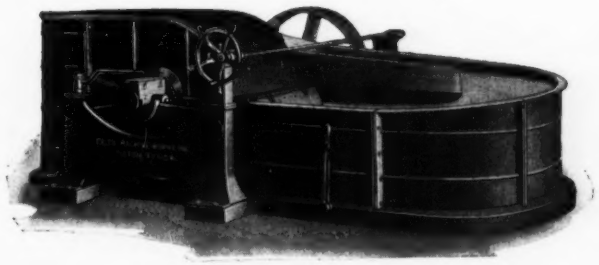

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erning valve. This increase in pressure on the diaphragm of the feed control valve acts against the spring pressure holding the valve open and the admission of feed to the boiler is gradually arrested.

Should the water level in the boiler rise to such a point as to submerge all the holes in the sampling tube, only hot water can pass into the element pressure chamber, where the lower pressure causes some of the water to turn into steam, with the result that the pressure in the chamber, piles up, aided by the resistance of the outlet orifice to the passage of the mixture of water and steam. This elevation in the element chamber pressure may assume such proportions that the pressure transmitted to the diaphragm of the feed control valve will shut off the supply of feed water to the boiler.

### Generator and Regulator

In another type of feed water regulator, the one employed in the system of feed control described as in use at the plant of the Champion Coated Paper Company, a pressure generator, consisting of an inclined tube connected top and bottom with steam and water spaces of the boiler, spans the desired high and low water levels. Under normal conditions, the water in the generator tube, which is surrounded by a larger, concentric, radiator-type tube filled with water and connected to a diaphragm, spring balanced, control valve in the feed line to the boiler, assumes a mid-point position.

If the water level in the boiler drops, however, the water in the generator element is also reduced and more of the inclined tube is filled with steam. This additional source of heat generates steam in the outer water jacket and increases the pressure on the diaphragm of the feed water regulator valve, causing the valve to open wider and increase the rate of feed to the boiler. Too much water in the boiler, on the other hand, elevates the level of the water in the inclined tube of the pressure generator, displacing some of the steam, and by so doing relieves the pressure on the diaphragm of the feed water regulating valve. The control spring of the valve then gradually throttles the flow of feed water to the boiler and the proper water level is promptly regained.

Various modifications of this type of feed water regulator have been developed, as will be noted in some of the accompanying installation views, as have also variations in some of the other types of feed water regulators which have been endorsed briefly, but the foregoing comments should suffice for a general exposition of the principles underlying some of the modern methods of automatic feed water regulation. Some of the devices and apparatus mentioned are more adaptable to service under conditions of high steam pressure operations than others and some, doubtless, effect closer and more sensitive regulation of water level, but they have proved, one and all, eminently practical and of much value in satisfactorily solving the important problem of feed water regulation. Furthermore, the investment entailed in the installation of a modern system of automatic feed water regulation is relatively nominal and is certain to be liquidated in short order by the many economies and benefits effected.

Automatic boiler feed water regulation enables the boiler to follow swinging loads and makes for uniform pressure and high quality of steam. Better water rates for turbines and engines result, improving the efficiency and economy of the power units, and substantial aid is rendered in combustion control. The re-handling of condensate is reduced and there are marked economies in operating and maintenance expenses, besides all of which there is the vital question of safety secured through the constant and sensitive control of a proper water level in the boilers.

## Reforestation Work in New York

[FROM OUR REGULAR CORRESPONDENT]

WATERTOWN, N. Y., April 14, 1931—Many of the Northern New York counties are carrying on extensive reforestation work and a number of orders for spring plantings have been placed with the Conservation Department. In Jefferson county over 780,000 trees have been ordered, while St. Lawrence reports that nearly 900,000 will be planted this spring. Oswego county has plans under way for planting 395,000 trees, according to estimates, but there is a possibility that this number will be increased. Orders from Lewis county call for 933,500 trees this year and so far leads all in its planned activities. Additional orders from the various counties are expected to be received by the department. Up to this time 5,915,500 trees have been ordered compared with about 4,700,000 last year.

In Jefferson county a tract of several hundred acres has been purchased on which plantings under the direction of the county forester will be started early in the spring. The plantings will consist mostly of spruce trees although it is likely some pine and balsam species will be imported from the state nurseries. The county already ranks among the leaders although it has only been engaged in reforestation for the past two years. Plantings in 1930 amounted to about 300,000 trees and plans this year call for this number to be trebled. Observers claim that the county can plant a million trees yearly for a considerable period before absorbing all of its idle land acreage with new forests which will result in timberlands returning revenues of good size.

## Federal Forest Protection

APPLETON, Wis., April 13, 1931—Although the spring season has been dry enough to induce forest fires, Wisconsin thus far has escaped any of its usual pulpwood and timber losses from this source. This is due partly to the increased vigilance of forestry and conservation officials. Additional lookout towers have been erected and many new precautions taken to prevent or detect outbreaks.

In order to stem the extent of damage done by rodents to forest areas, the federal forest protection board will ask the government for the employment of an entomologist, a biologist and a pathologist to study this problem. It is found that these rodents and insects do more damage than fires, and that plant and tree diseases also need to be checked.

An appropriation of $2,000 has been allowed by the forestry service for the first time this year to employ airplanes to detect fires. These will be especially effective on hazy days, when visibility is difficult from lookout stations.

Rapid progress is being made with new roads in the Flambeau and Maquah national forests, so as to make them accessible for ranging and fire fighting. Liberal crews of men are being employed on the improvements. The government is spending $72,500 in Wisconsin this year, of which $42,500 is an emergency appropriation for immediate use, and the remaining $30,000 will be available after July 1, 1931.

## Fairmont Box Co. Chooses Directors

CANAJOHARIE, N. Y., April 14, 1931—At the annual meeting of stockholders of the Fairmont Box Company, the following directors were elected: Bartlett Arkell, W. C. Arkell, E. W. Sineman, R. H. Dollison, G. W. Sharp, J. S. Ellithorp and F. E. Barbour. The directors then elected as officers the following: W. C. Arkell, president; Bartlett Arkell, vice-president, and R. N. Dollison, vice-president; E. W. Shineman, treasurer; G. W. Sharp, assistant treasurer and secretary; F. E. Barbour, assistant secretary.

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## FOREIGN PAPER TRADE

February exports of paper and paper products were valued at $1,809,857, compared with $2,617,226 a year ago, or a decrease of approximately 30 per cent, according to the Paper Division of the Department of Commerce. The only items that did not share in this loss were cash register and adding machine rolls, which totaled $62,592 and were 122 per cent higher, and greaseproof and waterproof papers which gained 30 per cent and amounted to $65,458. The heaviest losses occurred as follows: Sheating and building paper, 88 per cent; wall board of paper or pulp, 62 per cent; papeteries (fancy writings), 60 per cent; cover paper, 53 per cent, while exports of the following items declined from 40 to 50 per cent: fiber insulating lath or board, paper hangings (wall paper), other writings, blotting paper, tissue and crepe paper, wrapping paper and book paper, not coated, and from 25 to 35 per cent losses were noted in the following: newsprint, paper towels and napkins, other paper board, boxes and cartons, envelopes, vulcanized fiber sheets, strips and tubes, and toilet paper, compared with the same month last year.

February exports of paper and products fell 6 per cent short of the preceding month's total. The only notable gains were in toilet paper, the exports of which were 46 per cent higher and cash register and adding machine paper, which increased 38 per cent. The heaviest loss occurred in wall board of paper or pulp, being 48 per cent lower than in the preceding month, while losses from 25 to 35 per cent were registered in the following: Book paper, not coated, cover paper, paper towels and napkins, blotting paper, paper hangings and paper bags.

Total exports of paper base stocks during this month amounted to $171,210, being 32 per cent less than a year ago, but 17 per cent higher than in January. Exports of soda pulp showed a decrease of 58 per cent, compared with a year ago, but were higher than in the preceding month. Rags and other paper stocks maintained last month's level, but were 31 per cent lower in February, 1930.

February imports of paper and paper products totaled $9,871,476, compared with $10,367,617 in the same month last year and $10,784,264 in the preceding month. The great bulk of this item is accounted for by standard newsprint, the imports of which amounted to $8,423,765 during the month under review, of which Canada, our chief supplier of this product, furnished $7,632,028 worth. Other imports of this commodity a year ago amounted to $8,925,175 and in the preceding month they were valued at $9,734,933. Next to news print our most important import item in this group is cigarette paper, cigarette books and covers, the imports of which are rapidly increasing, totaling $825,236 in February as against $271,898, a year ago and $345,715 in the preceding month. Imports of the following items were considerably less than a year ago: Greaseproof and waterproof paper, kraft wrapping, writing and drawing papers, etc., surface coated papers, pulp board in rolls, leatherboard, test board and wall board, hanging paper, paper boxes, papier-mache and pulp manufactures, n.e.s. Compared with the preceding month heavy gains were noted in greaseproof and waterproof, other wrapping paper, pulp wood in rolls, duplex decalocomania paper, not printed and paper boxes.

Imports of paper base stocks in February totaled $6,094,364, or a decrease of 48 per cent, compared with a year ago, and a decrease of 28 per cent, compared with the preceding month. Imports of pulpwoods fell 45 per cent short of last year's total, rough spruce, 98 per cent, peeled spruce 48 per cent, rossed spruce 15 per cent, unbleached sulphite wood pulp, 52 per cent, unbleached sulphate wood pulp (kraft), 48 per cent. Imports of bleached sulphate wood pulp, were on the other hand considerably higher than a year ago, but declined from a total of $384,905 in January to $128,453 in February. The heaviest loss occurred in rags for paper stocks, the imports of which amounted to only $69,354 in February, as against $511,797 a year ago. In January they amounted to $170,999.

## PRICE DECLINE FOUND CHECKED

The sharp world-wide decline in commodity prices was halted in the early part of 1931, the National Industrial Conference Board asserts in a report published yesterday, entitled "A Picture of World Economic Conditions at the Beginning of 1931." The consensus of the report, which covers twenty-five countries, is called encouraging as compared with a similar report in the early fall of 1930.

Two general conclusions are suggested by the report, the general survey states: "First, those countries which had been able to maintain a high level of industrial and trade activity after an acute business depression had set in elsewhere began to feel the effect of an unfavorable international situation toward the end of 1930. Second, there is a general feeling in most countries of the world that by the end of 1930 the worst phases of the business depression had probably been reached, and that, while no immediate and rapid business revival is expected the business situation in 1931 should slowly but steadily improve."

Regarding Europe, the report says: "The most hopeful aspect of the situation is that the representatives of industry, trade and finance, as well as the responsible public authorities, appear to be definitely recognizing the fact that an economic recovery can be brought about only by their own efforts, by the exercise of strictest economy in private and public affairs, and by the application of most advanced methods of rationalization in the conduct of business. If these efforts are accompanied by earnest co-operation in the field of international affairs, the world may look forward to an early period of economic recovery and international peace."

The internal soundness of Switzerland, Sweden, the Netherlands, and Denmark is stressed in the report. On the other hand, it is found that the world decline of food and raw material prices has affected Central and South America with extraordinary force. The fundamental cause of China's economic difficulties is found to be its state of political uncertainty, while in Australia excessive public expenditures and political uncertainty darken the horizon.

## Northeast Could Grow Own Pulp Wood

Instead of depending on foreign countries for future supples of pulpwood, it would be advantageous for New England and New York to grow their own, according to Marinus Westveld, silviculturist at the Northeastern Forest Experiment Station of the Forest Service, U. S. Department of Agriculture. More consideration should be given to the possibilities of forcing spruce lands of the Northeast to produce the pulpwood required by the region, he says.

Pulpwood production and manufacture has been important in the Northeast from the beginning of the industry in North America, and favorable climate and transportation facilities have made the forests of this region a good source of wood supply. To keep the Northeast in the running in pulpwood productivity, young growth must be established on the land before the mature trees are cut off, Mr. Westveld says. The present practice of clear-cutting makes this imperative. Forest fires must be prevented. The need of some planting, slash burning, and cutting of weed trees is also indicated in certain areas.

Recent studies to determine the effects of the clear-cutting method on the development of the future stand, and of hardwood competition, seed-bed condition, slash disposal, and other factors on pulpwood reproduction, are discussed by Mr. Westveld in Technical Bulletin 223-T, Reproduction on Pulpwood Lands in the Northeast, just published. Copies may be obtained from the Office of Information, U. S. Department of Agriculture, Washington, D. C.

## Terre Haute Mill Damaged by Fire

[FROM OUR REGULAR CORRESPONDENT]

INDIANAPOLIS, Ind., April 13, 1931—Damage of more than $10,000 was caused to the machine shops, garage and sawmills of the south plant of the Terre Haute Paper Mill in a fire at Terre Haute, Ind. Most of the loss is covered by insurance. The fact that a strong north wind was blowing probably saved the company from worse loss. The fact that the nearest fire-plug is 1,000 feet away from the plant complicated fighting the flames though. A second alarm was sounded as soon as the first companies reached the scene.

## St. Regis Makes Good Report

[FROM OUR REGULAR CORRESPONDENT]

WATERTOWN, N. Y., April 14, 1931—The St. Regis Paper Company in its annual report for the year ending Dec. 31, 1930, shows a net income, including $821,561 in undistributed earnings of the Niagara Hudson Power applicable to holdings, of $4,257,521 after interest, depreciation, federal taxes, subsidiary preferred dividends, etc., equivalent after seven per cent preferred dividends to 95 cents a share on 4,122,464 shares of common stock outstanding at end of the year, excluding 2,536 shares held in treasury. Including equity in undistributed earning of Niagara Hudson the net income for the year was placed at $1.15 a share on the common stock outstanding at the end of that period. In comparison the company in 1922 reported net income of $4,664,873 equal to $1.08 a share on 4,000,000 common shares outstanding. Taking into consideration equity in undistributed earning of Niagara Hudson the net income for that year was equal to $1.30 a share on the common stock.

Floyd L. Carlisle, president, in the report states that over 90 per cent of gross operating revenues resulted from the sale of catalogue and directory paper, specialty papers, filling machines, heavy-duty paper bags, machine parts, wire ties, etc., while less than ten per cent was derived from news print sales. It is interesting to note that ten years ago about 90 per cent of the entire business consisted of news print. He also called attention to the expansion of manufacturing facilities during the year and the annexation of three large concerns. The first of these taken over was the Cornell Bag Corporation which holds valuable patents on multiwall paper bags and filling machines. Arrangements were later made for the purchase of the Bates International Bag Co. which derives its income from paper bags sold by foreign licensees, from the sales and leasing of filling machines and the sale of machiney parts, etc. Future prospects for expansion of this foreign business are considered good by the owners. Next came the purchase by a subsidiary, the St. Regis Kraft Co., of a pulp mill at Tacoma formerly owned by the Union Bag & Paper Co. This mill has an annual capacity of about 46,000 tons of kraft pulp. All these properties were acquired through exchange of common stock involving a total issuance of 125,000 shares.

Other arrangements made during the year were for the starting of a new factory for bag-making machines at Oswego and a modern plant for turning out paper bags at Los Angeles, Cal. Additional bag plants were also opened at Oakland, Cal., and Seattle, Wash.

## Cost and Technical Men to Meet

KALAMAZOO, Mich., April 14, 1931—Plans are practically perfected for the Fourth annual interstate meeting of the Cost and Technical Association of the Paper Industry, which will be held at the Park-American hotel, May 22 and 23. A few of the program details are as yet undetermined, but publication is expected in a short time.

The sessions open Friday noon with a joint luncheon and meeting, which will be addressed by a man prominent in the paper industry. There will be sectional meetings Friday afternoon and the banquet in the evening. Dr. Kress is to speak on the progress of the Institute of Paper Chemistry, at Appleton, Wis.

Saturday morning will be devoted to sightseeing, golf or what not, with a luncheon at noon and more sectional meetings in the afternoon. Glenn Ingling, of the Kalamazoo Paper Company, is chairman of the committee on arrangements. He says the program will be interesting and entertaining as well as instructive.

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Section of the
Technical Association of the Pulp and Paper Industry
Edited by Ronald G. Macdonald, Secretary

# Current Paper Trade Literature

## Abstracts of Articles and Notes of Papermaking Inventions Compiled by the Committee on Abstracts and Bibliography of the Technical Association of the Pulp and Paper Industry

Clarence J. West, Chairman

**For photostatic copies of articles appearing in the Abstracts Section, address the chairman of the Abstracts Committee, Dr. Clarence J. West, National Research Council, 21st and B Streets, Washington, D. C. The charge for this service is as follows: 9 x 11 inches, 18 cents each; 18 x 11 inches, 35 cents each; 22 x 18 inches, 70 cents each; minimum charge, 50 cents. Copies of United States patents may be obtained from the U. S. Patent Office, Washington, D. C., for 10 cents each. Send currency, not stamps.**

### Machinery

**Controlling the Drying of Paper on the Paper Machine.** F. E. P. Klages. Eng. pat. 330,596, March 8, 1929.—A web bulb acting thermostatically applied with air drawn from the vicinity of the sheet substantially short of the completion of travel on the drying rolls, regulates the supply of heat to the dryer cylinders, thus controlling the moisture content of the sheet leaving the dryers.—A.P.-C.

**Regulating and Gauging the Thickness of Paper.** A. E. O'Dell, Eng. pat. 327,655, July 245, 1929.—Paper is made accurately to a definite thickness by passing it through caliber rolls prior to satinizing. The middle roll has a reduced part forming with the two adjacent rolls rectangular openings of the desired thickness through which the paper is passed one or more times.—A.P.-C.

**Ross-Grewin System.** A. E. Montgomery. Paper Mill 53, No. 39, 14, 16 (Oct. 11, 1930).—A brief description of the Grewin, vapor absorption, drypector and cross ventilation systems, showing that the Grewin seems to have all the advantages and none of the disadvantages of the others. The four main advantages claimed for it are: increased drying capacity, more even drying across the sheet, increased felt life, decreased steam consumption. —A.P.-C.

**Slitting Paper Webs.** G. C. Marks. Eng. pat. 322,499.—In a machine for slitting a paper web, coacting shearing disks are mounted on geared shafts driven from a pulley. To prevent whipping, the shafts are made in sections supported by adjustable bearings and connected by flexible couplings. The shaft carrying the upper slitters is supported on end bearings adjustable in the frame by means of screws. In a modification two shaft sections are joined by a flexible coupling and the shafts adjacent the coupling are supported by bearings. In a further modification the shaft is divided into three sections.—A.P.-C.

**Slitting Paper Webs.** W. W. Lister. Eng. pat. 322,945.—In a slitting device for paper-waxing, winding and other machines, a backing roll and cooperating slitting disks are carried on a frame pivoted on a shaft and balanced by suitable weights. A winding roll is carried on a bracket from a frame and drives the backing roll by friction. The slitting disks are mounted on levers on a fulcrum adjustable by a lever and are pressed by adjustable springs. To indicate the diameter of paper on the winding roll, the frame is connected by a chain to an indicator disk. The winding roll may consist of a number of separate tubes clamped on a driven spindle, or a single tube may be subdivided in situ by a rotary cutter. The frame is locked in the extreme position for removing the roll by a detent.—A.P.-C.

**Paper Drier.** John W. Vedder assignor to Rice, Barton and Fales, Inc. U. S. pat. 1,760,923, June 3, 1930.—The driers are arranged in vertical sets. The driving gears on each cylinder are smaller than the diameter of the cylinder, and all the rolls of a given series are rotated in the same direction by means of idler gears interposed between the gears of successive rolls of each vertical set. The paper and felt wrap around more than half the circumference of each roll. Between the driers, both the sheet and the felt are passed around guide rolls which are placed so that the paper and felt are not in contact with each other. Two or more of the rolls, preferably at the bottom, are used as felt driers, the felt being passed around them just before coming into contact with the first paper-drying roll.—A.P.-C.

**Paper Slitter.** John R. Spoor. U. S. pat. 1,754,969, April 15, 1930.—The top slitting disks are driven by frictional contact with the respective lower knives which are positively driven. Each top slitter is keyed to a small individual shaft mounted on ball bearings placed in the ends of a fork adjustably clamped to a transverse supporting bar. At one end of the small shaft of the top slitter is a spring which presses the top slitter yielding against the corresponding lower slitter. At the other end of the shaft is an adjusting pin projecting through the supporting fork and provided with a cross handle for its manipulation. The adjusting pin has a longitudinal and an annular groove engaging a stop pin in the fork. When the disk is in operation, the stop pin engages the longitudinal groove near the inner end; to render the disk inoperative, the adjusting pin is pushed inward till the stop pin can engage the annular groove and the adjusting pin is then turned to keep the disk out of contact with the lower cutter.—A.P.-C.

**Slitter.** Frederick W. Lodding assignor to Rice-Barton and Fales, Inc. U. S. pat. 1,760,243, May 27, 1930.—The slitter is provided with a set of slitting disks rotated at high speed, as

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usual. Coacting with each disk is a sector-shaped knife which is moved back and forth so as to present a new cutting surface to the paper at all times. The sector-shaped knives can be swung out of contact with the slitting disks for threading in the web.—A.P.-C.

**Winding Machine.** James A. Cameron and George B. Rickard assignors to Cameron Mach. Co. U. S. pat. 1,759,538, May 20, 1930.—The main object of the invention is to provide suitable ejecting means to move the finished roll out of the valley between the two winding drums and outwardly over one of these drums so that it will be in position where it can be easily and conveniently handled either by means of skids or by tackle. To this end, one or more cam-shaped ejecting members are provided which are mounted on a shaft parallel to and to one side of the wound roll. The contour of the ejecting members is such that when they first engage the roll, the portion of the cam which is near the supporting shaft is first brought into action, and, as the shaft turns, portions more remote from the center of the shaft become effective.—A.P.-C.

**Driven Slitter for Paper-Slitting Machines.** Joseph A. White assignor to The Moore and White Co. U. S. pat. 1,759,676, May 20, 1930.—The bottom or driven slitters have usually been mounted on a heavy shaft having its bearings at each side of the machine; this shaft is driven at a high speed and vibrates to a considerable extent, causing the slitters to wear away very rapidly. In making repairs, the entire shaft must be removed in order to replace an imperfect slitter. According to the invention this is obviated by mounting the slitters independently on a heavy cross-bar and using a light shaft for wriving the slitters which are geared to the shaft. With this construction an imperfect slitter can be readily replaced without disturbing the balance of the slitters.—A.P.-C.

**Reel.** Herman L. Kutter assignor to The Black-Clawson Co. U. S. pat. 1,764,322, June 17, 1930.—The invention provides a large drum in contact with which there are two reeling mandrels, only one of which is in operation at a time. The bearings supporting the ends of the mandrels are placed in the ends of relatively long pivoted arms to permit of the displacement of the mandrel as the roll builds up. The bearing arms at the opposite ends of each mandrel are movable independently of each other within predetermined limits, so as to permit the roll by its own weight to automatically maintain uniform pressure and tension on the paper as it is wound on the mandrel, irrespective of irregularities in the thickness of the paper. Means are provided for raising the mandrel out of its bearings after a roll has been wound. In order to transfer the paper from a full mandrel to an empty one, mechanical means are provided for cutting a lead strip from the sheet while it is still being wound. In order to transfer the paper from a full mandrel to an empty one, mechanical means are provided for cutting a lead strip from the sheet while it is still being wound; the lead strip is wound around the empty mandrel, after which the knife is drawn across the machine, cutting the sheet diagonally.—A.P.-C.

**Modern Standards in Sectional Paper Machine Drive.** R. R. Stoltz. Paper Trade J. 91, No. 15, 49-51 (Oct. 9, 1930).—A review of the major improvements made in the Westinghouse electric sectional paper machine drive since 1919.—A.P.-C.

**Paper Machine Drive.** F. O. L. Chorlton and Charles Walmsley & Co., Ltd. Fr. pat. 670,983, March 6, 1929.—A set of epicyclodial gears is provided for each section of the machine and the sets are connected together by means of a suitable driven shaft. The gears are of such a type that the greater portion of the power supplied to them is transmitted by the epicyclodial gears to the driving shafts of the respective sections, while only a small portion of the power is used to vary the speed of the epicyclodial trains.—A.P.-C.

**Air, Heat and Moisture Balance for Paper Machine Room.** A. S. Goodrich and H. G. Brehme. Paper Trade J. 91, No. 11, 73-78 (Sept. 11, 1930); Paper Industry 12,1040-1044 (Sept. 1930).—A description of the general features of the air and steam supply of the room housing Nos. 3 and 4 paper machines at the Erie mill, and of tests made to determine the amount of steam required in the driers and the quantity and condition of the air passing through the machine room, for the purpose of seeing if the efficiency of the present equipment is reasonable or can be improved.—A.P.-C.

**Selection of Sectional Drive Equipment.** S. A. Staege. Paper Mill 53, No. 38, 14, 32, 34 (Sept. 20, 1930).—A brief discussion of the various factors entering into and effecting the selection of the equipment in a sectional paper machine drive.—A.P.-C.

**Calender.** Johannes Kleinewefers assignor to Joh. Kleinewefers Sohne. U. S. pat. 1,765,922, June 24, 1930.—The invention relates to a hydraulic pressure device on calender levers. The calender is fitted with a roll-loading device, which is controlled by means of two pairs of oppositely acting pressure pistons acting on the levers, one of each pair of pistons acting directly and the other through the intermediary of connecting rods on the loading levers of the upper pressure roll. Both pistons can be operated by control valves alternately more or less, in order to load the calender or to reduce the load or suppress it entirely and to lift the upper pressure roll. The fulcrums of the loading levers may be adjustable so as o permit of still more accurate regulating of the pressure on the two sides of the calender. To this end the bearing brackets of the loading levers rest in guide slots of the uprights and they are adapted to be adjusted individually or together by means of spindles and nuts together with hinge elements sliding in guide slots in the loading levers. In order to obtain very rapidly the pressure equalization, the two loading levers are provided with a common driving gear, by means of which the fulcrums of the loading levers can be shifted simultaneously in opposite directions so that upon a pressure increase on one side of the calender a decrease on the other side follows instantaneously. Means are also provided for leading the calender either hydraulically or mechanically as desired. In this case the rolls are controlled by a lever mechanically loaded in known manner, and coupled with a two-armed lever controlled from the pressure cylinder and connected with the pressure and pulling pistons by means of a removable connecting bolt to obtain the hydraulic pressure.—A.P.-C.

**Safety Guard for Paper Plates.** Robert M. Mutch. U. S. pat. 1,761,045, June 3, 1930.—A guard is provided which is arranged to move up and down in front of the bite of the rolls so as to close up the entrance to the bite of the rolls and thereby prevent entrance of the operator's hands there between. Means are provided for operating the guard which is actuated by and under the control of the book, so that the guard is moved into or out of its guarding position according as the book is moved into or out of the bite of the rolls.—A.P.-C.

**Support for Paper to Be Unwound.** Arthur W. Cole assignor to Rex Paper Co. U. S. pat. 1,766,105, June 24, 1930.—The roll of paper to be unwound is supported in two spaced bars, supported on suitable pedestals. The bars are grooved longitudinally to receive bars on which rest the spindles of the roll. One of the bars is provided with a device to adjust its longitudinal position relatively to the fixed bar. Each of the roll-supporting bars has a stop near the end, against which rest the spindles of the roll while it is being unwound.—A.P.-C.

**Reinforced Paper.** Edward L. Benedict. U. S. pat. 1,766,096, June 24, 1930.—The patent covers a sheet of paper containing reinforcing strands composed of paper pulp embedded therein and disposed between the exposed surfaces thereof.—A.P.-C.

### Corrosion

**Corrosion Resistant Alloys for Sulphite Mills.** Thomas H. Nelson. Paper Trade J. 91, No. 6, 67-71 (Aug. 7, 1930); Techn. Assn. Papers Series 13, No. 1, 179-183 (May 1930).—A discussion of corrosion-resistant alloys from the standpoint of their suitability for sulphite mills, showing the considerable influence

which variations in working conditions may have on the resistance of a given alloy, and suggesting that corrosion-resisting alloys might be considered from the standpoint of their residual iron content rather than of the amount of alloying metal added. —A.P.-C.

**Monel Metal in Pump Rods and Other Paper Mill Equipment.** Anon. Pulp Paper Mag. Can. 30, 245 (Aug. 28, 1930).—At the mill of the Fox River Paper Co., Appleton, Wis., the use of monel metal pump rods were found to result in a saving of 85 per cent in pump maintenance cost as compared with steel pump rods, though the first cost of the monel metal rods was 3 times as high. Monel metal was also found more satisfactory than brass or bronze for suction box rods, beater bed plates and screws for rotary screens.—A.P.-C.

**Classification of Corrosion-Resisting Steels.** H. N. Booker. Paper Industry. 12, 849-851 (Aug. 1930).—The corrosion-resisting steels at present on the market are grouped into four classes, and a few of the properties of each group are given.—A.P.-C.

**Some Pointers on Chromium-Nickel and the Fabrication of Acid-Resisting Steel.** Pulp Paper Mag. Can. 29, 625-626, 640, 652 (May 8), 659-660, 668, 680, 682 (May 15, 1930).—An address dealing with steels ranging in composition from 14 to 20 per cent chromium, 7 to 12 per cent nickel, and not over 0.20 per cent carbon, and more particularly with those containing either 18 per cent chromium and 8 per cent nickel or 15 per cent chromium and 11 per cent nickel.—A.P.-C.

**Performance of Monel Metal in Jordan Fillings.** Anon. Pulp Paper Mag. Can. 29, 723-724 (May 29, 1930).—A comparison of the performance of steel, bronze and monel metal for jordan fillings in a rag-content mill showed that monel outlasted steel and bronze from 2 to 14 times, and that the cost per jordan per year was 78 per cent lower than that of steel and 60 per cent lower than that of bronze.—A.P.-C.

### Mill Problems

**New Type of Continuous $So_2$ Recorder.** C. O. Sisler and R. E. Cooper. Pulp Paper Mam. Can. 29, 791-792, 810 (June 12, 1930).—A constant current of gas is injected into a constant current of water, and the solution is passed through a cell where its electric conductivity is measured continuously using a 60-cycle alternating current to prevent electrolysis and polarization. The instrument is made self-compensating for ordinary fluctuation in line voltage. It is in use in several of the Abitibi mills and has proved rugged and accurate and has given very few operating troubles.—A.P.-C.

**Heating Methods in Paper and Board Mills.** E. Norman Beavis. World's Paper Trade Rev. 94, 1150-1154 (Sept. 26, 1930).—A brief discussion of the heating of paper mills, from which it is concluded that the heat-diffusing unit-system is the most economical and efficient.—A.P.-C.

**Mill Piping Considerations.** Reginald Trautschold. Paper Trade J. 91, No. 10, 54-60 (Sept. 14, 1930).—A brief review of the respective qualities and inherent properties of the various classes of piping.—A.P.-C.

**Lubrication of Pulp and Paper Mill Equipment.** H. E. Stafford, Paper Industry 12, 1026-1029 (Sept. 1930).—A brief discussion of the properties required of lubricants for different types of service in pulp and paper mills.—A.P.-C.

**Developments in Driving Belt Transmissions.** Reginald Trautschold. Paper Trade J. 90, No. 26, 32-44 (June 26, 1930).—A discussion of the importance of internal friction and of surface fricton in the selection of belting for various requirements. —A.P.-C.

**Continuous Paper Weigher.** Anon. Paper Mill 53, No. 17, 12 (April 26, 1930).—A brief discussion of the merits of the Toledo Continuous Auto Check for controlling the weight of paper as it is being made on the paper machine.—A.P.-C.

**New Type of Remote Control.** R. D. Bean. Paper Mill 53, No. 29, 16, 19 (July 19, 1930).—A description and discussion of the merits of the DeFlores System of remote control of valves. —A.P.-C.

## TAPPI Pacific Section to Meet

The Pacific Section of the Technical Association of the Pulp and Paper Industry meets on April 18 and 19 at Everett, Wash. The program of papers announced by C. W. Morden, section chairman is unusually large and will require the holding of two simultaneous sessions, devoted to pulp and paper respectively.

Following are the papers being presented:

A Review of Current Research at the U. S. Forest Products Laboratory, by C. E. Curran, Forest Products Laboratory.

Wood Waste as a Fuel in Pulp and Paper Plants, by H. W. Beecher, C. C. Moore & Co.

Western Cellulose, by E. Richter, Uuget Sound Pulp and Timber Company.

Disposal of Red Liquor, by Dr. Nightingale.

Controlling Paper Mill Wastes with Chlorine and Ammonia, by Bryan L. Shera.

Bleachability Determinations of Sulphite Pulp, by N. W. Coster, Fidalgo Pulp Manufacturing Company.

Hot Acid Recovery in Sulphite Manufacture, by H. Lundberg, G. D. Jenssen Company.

Three Phase Bleaching as Applied by Western Wood, by R. S. Hatch, International Bleaching Corporation.

White Water Utilization, by R. J. Schadt, Hawley Pulp and Paper Company.

Fractional Screening of Pulp, by Axel Klingberg, Puget Sound Pulp and Timber Company.

Proper Speed of Chippers, by Sigurd Norman, Spaulding Pulp and Paper Company.

Fibrous Raw Material, by Dr. Leo Friedman, University of Oregon.

Proper Care of Rubber Covered Press Rolls, by G. E. Emigh.

Sulphate Smelters, by C. R. P. Cash, St. Regis Kraft Company.

Lime Recovery, by Ralph Reid, St. Helens Pulp and Paper Company.

Changes in Equipment and Design or Application in the Pulp and Paper Industry, by Ray Smythe, Willamette Iron Works.

## New TAPPI Members

Harold F. Dunbar has been mechanical engineer for nearly forty years at the Keith Paper Company, Turners Falls, Mass.

Theodore F. Geissler is an attorney at law located in the Platt Building, Portland, Ore. He was admitted to the bar in New York in 1884 and in Oregon in 1890. In 1903 he was admitted to the U. S. Supreme Court. For more than twenty years he has been patent counsel for the Crown Willamette Paper Company and other companies.

George H. Knox is an assistant chemist for the Crocker-McElwain Company, Holyoke, Mass. He was recently a student at Northeastern University.

Alexs Lampen graduated from the Technical Institute of Helsingfors in 1903, following which he worked for a number of years in various German mills. He is at present managing director of the Tornator Pulp Company of Imatra, Finland.

William C. Lodge is a chemical engineer at the Cornell Wood Products Company, Cornell, Wis. After attending McGill University, he worked in the Canadian Inspection and Testing Laboratories, U. S. Government Acid Plant at Little Rock, Ark., the Canadian Forest Products Laboratories in Montreal, the Oswego Falls Corporation and Stanco, Inc. Mr. Lodge was formerly a member of the Technical Association.

Ralph A. Wilkins, is superintendent of the paper division of Bird & Sons, Inc., East Walpole, Mass. In 1919 he graduated from the University of Maine, following which he was research chemist for the National Aniline and Chemical Company in Buffalo and the Eastern Manufacturing Company at South Brewer, Maine. He was also pulp and paper instructor at the University of Maine. At Technical Association meetings he has read papers on the use requirements of shipboard and on water removal on the board machines.

# The Galvanic Behavior Of A Chromium-Nickel-Iron Alloy In Sulphite Liquors*

By W. Andrew Wesley [1] and F. L. LaQue [2]

In speaking of galvanic behavior of chromium-nickel-iron alloys it is realized that a field of discussion has been entered which has been the subject of much controversy because of the erratic behavior of this type of alloy in its galvanic relations. When at the same time it became necessary because of the interests of this association to choose as the corrosive agent such an unstable solution as sulphite liquor the assignment automatically became a task fraught with experimental difficulties. For this reason it became necessary for the sake of clarity to run some parallel experiments using more stable solutions and alloys to demonstrate some controlling factors and to throw light on the underlying causes of the irregularities noticed in the laboratory and in operating equipment. This paper therefore does not pretend to be a complete exposition of the subject but it has been written in the hope that it will serve as an introduction to the study of such phenomena by covering a few of the fundamental points involved.

It would seem to be in order to introduce at this time a brief discussion of some of the fundamental aspects of galvanic corrosion in general in order to facilitate interpretation of the results of the experiments to be described.

Galvanic corrosion can be defined as the abnormal corrosion resulting from the electrical connection of two or more dissimilar metals in contact with a corrosive liquid.[3]

Such combinations of metals give rise to electric currents which affect the corrosion of the metals. A simple example of this phenomenon is the cell formed by immersing a strip of copper and a strip of zinc in dilute sulphuric acid. When the two metals are immersed the zinc begins to dissolve slowly but when they are joined together by a copper wire the zinc dissolves rapidly and if a current indicating instrument be inserted in the electrical circuit an electric current will be found to be generated. The direction of flow of this current is important since it determines which of the metals will go into solution more rapidly. Since in this case the interest lies in what is happening to the metals in the solution, attention must be focussed upon the direction of flow of the current through the solution. It is evident that the current flows from the zinc through the solution to the copper and thence from the copper to the zinc in the external circuit. Under such conditions the zinc is dissolved and is said to be anodic, the copper from which the current leaves the solution is said to be cathodic. In any other couple under study the electrode from which the current enters the solution, that is which tends to dissolve, is called anodic and the other electrode cathodic.

Certain essential factors govern or influence galvanic corrosion, the most important of these are to be discussed in the following paragraphs.

### Potential Difference

In the first place there would be no galvanic corrosion unless there were a difference in potential between the two metals. It so happens that with any given solution the potential developed by each metal is peculiar to the metal. Although subject to variations resulting from influences of environment the potentials of metals in a wide variety of corrosives tend to maintain a systematic and fairly constant relationship to each other. It has, therefore, become possible to arrange metals in what is called the electromotive series. In this paper we are not so much interested in the physical chemists' electromotive series, which is based on the potentials measured between elements in contact with solutions containing a definite concentration of their ions, but rather our interest lies in a series based on the result of actual experience with the elements and alloys in corrosive solutions and on measurements made under operating conditions. The fact that such a series and the physical chemists' series do not show much variation is because the potentials developed are inherent properties of the elements and usually function to the same relative degrees under many conditions. The following arrangement shows several of the common metals and alloys arranged in an electromotive series which has been found to hold for many dilute aqueous solutions.

(Anodic end) Magnesium, Aluminum, and Duralumin.

Iron, Chromium iron (active), Chromium-nickel-iron (active), Tin and Lead.

Nickel, Brasses, Bronzes, Monel and Copper.

Chromium-iron (passive) and Chromium-nickel-iron (passive).

Silver, Gold and Platinum (Cathodic end).

In a metal couple, that metal higher in the list will tend to be anodic or to corrode and the metal lower in the list to be cathodic or protected. Corrosion may or may not occur depending on the conditions of exposure. It will be noted that the metals have been divided into groups. The metals in any group lie rather close together in their galvanic potentials and there is, therefore, little tendency toward galvanic corrosion between metals in the same group. Depending on conditions there may be a shifting of the order of metals within the groups but changes from one group to another are rare. It will be noted further that the chromium-iron and chromium-nickel-iron alloys have been included in two locations, one referring to the alloys in the active state and one to their passive state. In which state they will occur in practice will depend on the conditions of their surface and of their environment and will be discussed more fully in connection with the experiments described later in the paper.

### Resistance and Polarization

The next factor to be considered is the resistances offered to the flow of current. The mere existence of a potential difference is not sufficient for galvanic corrosion since the extent of the abnormal corrosion is directly proportional to the current flow. This fact is often overlooked by investigators who content themselves with voltage determinations without regard to the various aspects of current flow which really are the important considerations. If the resistance to the flow of current is great in proportion to the potential available there will be a relatively small flow of current and consequently little or no galvanic corrosion. Factors which may affect the flow of current are poor electrical contact between the two metals, high resistance in the electrolyte, insoluble and insulating corrosion products formed on the metal surfaces, and, usually of predominating importance, counter voltages resulting from polarization of the electrodes.

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* Presented at the annual meeting of the Technical Association of the Pulp and Paper Industry, New York, N. Y., Feb. 17-19, 1931.
Contribution of the Materials of Construction Committee.

[1] Research chemist, International Nickel Co., Bayonne, N. J.
[2] Development and research dept., International Nickel Co., New York, N. Y., contributing member, TAPPI.

[3] We are not here concerned with corrosion of the concentration cell type where the seat of the galvanic forces is in differences in the electrolyte rather than differences in the metals. This subject has been discussed by R. J. McKay, Trans. Am. Electrochem. Soc. 41, 201 (1922)—Ind. Eng. Chem. 17, 23 (1925).

According to electro-chemical considerations the corrosion process consists of two reactions occurring simultaneously, one the anodic reaction, involving the formation of ions from the atoms of metal, the other, the cathodic reaction, being the discharge of an equivalent number of hydrogen ions to form hydrogen atoms. These hydrogen atoms accumulate at the cathode and exert a counter voltage which is a type of cathodic polarization. In general it is this polarization which limits the magnitude of current flow and consequently controls the rate of corrosion. However, anodic polarization, usually resulting from the accumulation of the products of corrosion, is often appreciable and sometimes of prime importance. When the cathodic polarization is the controlling factor the rate of removal of the hydrogen atoms determines the rate of corrosion. Hydrogen atoms may be removed by direct evolution from the cathode in the form of hydrogen gas—as often happens in acid electrolytes—or by oxidation to form water or hydrogen peroxide. In normal corrosion both the anodic and cathodic reactions take place on the surface of a single metal. In galvanic corrosion the contact with the cathodic metal serves to enlarge the area available for cathodic reactions to take place. For any galvanic couple where the electrode areas and circuit resistances are fixed, the conditions which influence the rate of corrosion of the anode are not unlike those involved in ordinary corrosion and will not be discussed further here beyond the remark that they involve such factors as changes in the composition and concentration of the electrolyte, agitation, aeration, temperature, etc.

### Electrode Areas

In any couple a very important factor is the relative areas of electrodes—a large cathode will introduce proportionately larger increases in the galvanic corrosion of the anode. The limit of this effect will be determined, in part, by the conductivity of the electrolyte, which will govern the effective area of the electrodes in the electrical circuit. Where the two metals are submerged and joined along a line, the effects of galvanic corrosion are seldom apparent more than a few inches from the contact; if the anodic and cathodic surfaces are parallel then the corrosion may be wide-spread. It follows, then, that a large effective cathode area and a small anode area may result in very great acceleration of corrosion of the anode whereas a small cathode area and a large anode area should result in very little accelerated corrosion. For example, it would be very dangerous to fasten two copper plates with steel rivets for exposure to sea water since the steel would suffer rapid attack, whereas it would be reasonably safe to fasten steel plates with copper rivets, since the total acceleration of the corrosion of the steel would be small in any event and would be distributed over a relatively large area of steel. In the absence of interfering agencies the use of a cathode of effective area equal to the anode will result in additional corrosion equal to the normal rate of corrosion of the anode (total twice the normal rate). Whitman and Russell[4] have shown this to be true for iron and copper in sodium chloride solutions. Departures from this general rule often occur in acid corrosion where hydrogen is removed by evolution at the cathode, the governing factor being the relative values for the hydrogen overvoltages of the two electrodes. Hydrogen overvoltage is defined as the potential required to evolve hydrogen from an electrode in excess of the theoretical potential associated with the hydrogen ion concentration of the solution in contact with the electrode. It is easier to evolve hydrogen from an electrode having a low overvoltage than from one having high value. Consequently metals having a low hydrogen overvoltage value will tend to cause greater acceleration of corrosion as cathodes in such solutions than those of high overvoltage. In neutral electrolytes, since hydrogen evolution plays little part in the corrosion reaction, the governing factor will be the rate of supply of oxygen or other oxidizing agents to the cathode surface, for these oxidizing agents must combine with the hydrogen atoms in order for corrosion to proceed. In acid corrosion oxidizing agents may also be important since they may supplement the removal of hydrogen by direct evolution through combining with it directly to form water or hydrogen peroxide as the case may be.

In applying the principles discussed above to the case in point it will be seen that it would be hard to predict the galvanic behavior of a new alloy in any given corrosive until some experiments had been made to establish its general position in the electromotive series and to gain some idea of its cathodic or anodic behavior under given conditions. The object of the laboratory experiments was to throw some light on these points.

In view of the increasing use of the chromium-nickel-iron alloys in sulphite digester fittings and the apparent necessity, for economic reasons, to use these alloys in galvanic contact with brasses and bronzes (e. g., chromium-nickel-iron trim in bronze valves) it was thought desirable to investigate these combinations in the course of the experiments.

### Field Test

The laboratory work was preceded by a field test in which specimens of a chromium-nickel-iron alloy, two typical valve bronzes and a sample cut from brass tubing were exposed within the corrosion chamber inserted in the relief line of an operating sulphite digester. This chamber was designed and operated by the Materials of Construction Committee under the supervision of J. D. Miller at the York Haven Paper Company, York Haven, Pa. The samples were held in position between, and insulated from, two chromium-nickel-iron plates which supported them in the chamber. Samples of each of the bronzes and the brass were exposed both alone and galvanically connected with samples of a chromium-nickel-iron alloy. At the same time a sample of the chromium-nickel-iron alloy was exposed without galvanic connection with any other metal. All of the samples had the same exposed surface area. One of the bronzes was a copper, lead, tin, zinc alloy commonly used for acid resisting valves in sulphite mills. Henceforth in this paper it will be referred to simply as "valve bronze." The other bronze was a nickel bronze containing about 35 per cent of nickel to be referred to simply as "nickel bronze." The samples of brass were cut from a piece of extra heavy brass pipe such as is commonly used for digester relief lines. The assembly was exposed within the corrosion chamber over a period during which the digester was operated for 140.5 hours. The acid used for digestion was a mixture of about 30 per cent reclaimed acid from the digester relief and 70 per cent tower acid.

The results of the test are given in Table 1.

TABLE I
FIELD TEST IN DIGESTER RELIEF LINE

| Sample | Rate of corrosion in mg. per sq. dm. per day: Coupled with chromium-nickel-iron | Rate of corrosion in mg. per sq. dm. per day: Uncoupled | Rate of corrosion in inches penetration per year of continuous operation: Coupled with chromium-nickel-iron | Rate of corrosion in inches penetration per year of continuous operation: Uncoupled | Per cent increase in rate of corrosion of coupled over uncoupled |
|---|---|---|---|---|---|
| Valve bronze..... | 583 | 518 | 0.097 | 0.086 | 12.6% |
| Nickel bronze..... | 713 | 432 | 0.119 | 0.072 | 65 % |
| Brass ..... | 444 | 490 | 0.074 | 0.082 | —9.4% |
| Chromium-nickel-iron* | coupled 0 | uncoupled 0 | None of the chromium-nickel-iron samples corroded—coupled or uncoupled. | | |

* Chromium-nickel-iron. This designation refers to an alloy containing 18 per cent chromium, 8 per cent nickel, .12 to .15 per cent carbon and balance iron.

Following this test it was thought advisable to investigate the galvanic behavior of the chromium-nickel-iron: bronze combination in the laboratory under controlled conditions.

### Laboratory Experiments

APPARATUS: In the laboratory tests, control of the temperature and the velocity of movement of the solutions over the surfaces of the metal test specimens was accomplished by use of the "circular path apparatus" described by Fraser, Ackerman and

[4] Whitman & Russell, Ind. Eng. Chem. 16, 276 (1924).

Sands.[5] In this apparatus the test pieces were moved at a uniform rate in a circular path 2 inches in diameter. Both the anode and the cathode in each test were supported in glass stirrups in such a position that they remained parallel to each other and to their plane of motion. The anodes were discs 1 inch (2.54 cm.) in diameter by ¼ inch (0.64 cm.) thick while the cathodes were cut from sheet metal. To secure more uniform distribution of current flow the face of the cathode remote from the anode was lacquered. To each electrode was soldered a length of number 20 enameled copper wire, the soldered joint being coated with lacquer. These leads were connected to a calibrated 1.0 ohm external resistance with aid of which the current flowing in the galvanic circuit could be determined by measurements with a potentiometer.

In addition to the electrodes used in the galvanic tests, uncoupled specimens were also employed to determine the normal rate of corrosion of the anodic or of the cathodic materials under the same conditions of temperature, solution composition, etc.

The corrosive solutions were 4 liters in volume and were contained in glass battery jars. In those tests where full aeration is indicated the solution was maintained saturated with air introduced through a porous alundum crucible in the manner described by Thompson and McKay.[6] When sulphite liquors were used sulphur dioxide was introduced into the solution through the bottoms of Gooch crucibles, finer holes showing a tendency to become clogged.

The resistance of the complete galvanic circuit was determined by means of an alternating current bridge circuit similar to that used in measuring the conductivity of electrolytes.

MATERIALS

1. Sulphite Liquors: These solutions were obtained through the cooperation of J. D. Miller of the York Haven Paper Company who furnished the following analyses of the tower acid and reclaimed acid, representoing their composition as received at the laboratory:

| | Fresh Acid | Reclaimed Acid |
|---|---|---|
| Total $SO_2$, per cent by weight | 4.26 | 3.27 |
| Combined $SO_2$, per cent by weight | 2.06 | .76 |
| Free $SO_2$, per cent by weight | 2.20 | 2.51 |

The residues on evaporating to dryness at 105 deg. C. were: Fresh 3.53 per cent—Reclaimed 4.36 per cent.

ANALYSIS OF THE RESIDUE FROM EACH ACID

| | Fresh per cent | Reclaimed per cent |
|---|---|---|
| $SO_2$ on distilling with HCl | 4.41 | 16.63 |
| Insoluble in the HCl | .10 | .10 |
| $Fe_2O_3$ and $Al_2O_3$ | .16 | .20 |
| CaO | 33.30 | 17.40 |
| Sulphur Trioxide—$SO_3$ | 53.35 | 3.20 |
| Magnesium Oxide—MgO | 4.86 | 2.46 |
| | 96.18 | 39.99 |

From the above analysis of the residue of the reclaimed acid, about 60 per cent would be organic matter including the calcium and magnesium lignosulphonates. The wood used was hemlock.

II. Metal Specimens (Surface finished to number O French Emery paper).

1. Chromium-nickel-iron containing 18 per cent chromium, 8 per cent nickel, .12 to .15 carbon and the balance iron.
2. Commercially pure iron.
3. Valve bronze containing copper, tin, zinc and lead.
4. Platinum—(polished).
5. Monel Metal.
6. Nickel bronze containing 35 per cent nickel.
7. Brass cut from a piece of extra heavy brass pipe.

It was not known whether a surface of chromium-nickel-iron in its passive state could operate as a cathode in a galvanic couple without losing its protective layer of oxide by reduction. For this reason the behavior of the iron alloy in galvanic couples in a stable neutral and a stable acid electrolyte was studied before completing the tests in the more complex sulphite liquors.

[5] Ind. Eng. Chem. 19 (1927), p. 337.
[6] Ind. Eng. Chem. 15 (1923), p. 1114.

## The Galvanic Behavior of Chromium-Nickel-Iron in Aerated Sodium Sulphate Solution

A 0.5 normal sodium sulphate solution was chosen as a typical neutral electrolyte. It was observed that the chromium-nickel-iron remained unattacked when exposed to this solution and behaved galvanically just like a noble metal, that is, it remained passive. Data are given in Table II for tests in which the rate

TABLE II
GALVANIC COUPLES IN FULLY AERATED 3.5 PER CENT SODIUM SULPHATE SOLUTION

Velocity of motion of anode and cathode: 15.3 ft. per min.
External Resistance: 0.1 ohm.
Temperature: 30 deg. C.

| Experiment | | 1 | 2 |
|---|---|---|---|
| Anode | | Commercially Pure Iron | Commercially Pure Iron |
| Cathode | | Chromium-Nickel-Iron | Platinum |
| Anode area | | 0.142 sq. dm. | 0.140 sq. dm. |
| Cathode area | | 0.264 sq. dm. | 0.264 sq. dm. |
| Current at time | 0 minutes | 0.0028 amp. | 0.0036 amp. |
| | 30 | .0041 amp. | amp. |
| | 60 | amp. | .0029 amp. |
| | 90 | .0047 amp. | amp. |
| | 120 | .0045 amp. | .0039 amp. |
| | 150 | .0043 amp. | amp. |
| | 180 | .0042 amp. | .0040 amp. |
| | 1170 | .0034 amp. | .0035 amp. |
| | 1200 | .0034 amp. | .0036 amp. |
| | 1230 | .0034 amp. | .0035 amp. |
| Open circuit potential at | 1230 minutes | 0.550 volt | 0.708 volt |
| | 1260 | 0.691 volt | 0.762 volt |
| Anode weight loss | | | |
| Total corrosion | | 102.6 mg. | 107.4 |
| Normal corrosion | | 37.4 mg. | 36.9 |
| Galvanic corrosion | | 65.2 mg. | 70.5 |
| Equivalent galvanic current. | | 0.0031 amp. | 0.0033 amp. |
| Ratio galvanic to normal corrosion* | | 1.79 | 1.96 |
| Ratio cathode to anode area | | 1.86 | 1.88 |

* Galvanic current flowed only 1230 minutes of the total 1260 minutes.

of corrosion of commercially pure iron coupled with chromium-nickel-iron was compared with that of the iron coupled with platinum. The items of Table II are almost self explanatory. The item marked "Total Corrosion" is the observed weight loss of the anode during the test. The next item is the average normal rate of corrosion of the commercially pure iron in the same corrosive environment. The difference between the total rate and the normal rate is the weight loss corresponding to the galvanic corrosion suffered by the anode. By use of the Faraday and the gram equivalent weight for iron this galvanic weight loss was converted into the equivalent current in amperes. Neglecting disturbing factors this calculated current should be equal to the average current which actually flowed in the galvanic circuit.

The results given in Table II show that iron coupled with chromium-nickel-iron corroded at the same average rate as iron coupled with platinum. It is evident that the iron alloy retained its passive film and noble properties throughout the test in spite of the fact that hydrogen was constantly deposited upon its surface (although at a slow rate). The open circuit potential measurements show that the iron alloy was almost as noble as platinum in this solution.

The data of Table II also furnished proof to be added to that of Whitman and Russell that the ratio of galvanic to normal corrosion tends toward equality with the ratio of cathode to anode area, at least in neutral electrolytes and for a cathode to anode area ratio up to 2.

## Tests in Aerated Sulphuric Acid Solution

The behavior of chromium-nickel-iron in aerated 5 per cent sulphuric acid, a typical acid corrosive solution, proved to be somewhat more complicated than that in the neutral solution. Upon immersing a freshly surfaced specimen of this alloy in the acid solution it corroded actively for a short time and then seemed to revert gradually to a passive condition. Slight dis-

turbances of the surface of the alloy, even that occasioned by merely removing the specimen from the solution and re-immersing it, sometimes caused large changes in its potential relative to other more stable electrodes.

In air-free dilute sulphuric acid, freshly surfaced chromium-nickel-iron showed no tendency to become passive but corroded freely instead. With air saturated solutions the environment was oxidizing enough to enable the iron to maintain a passive film over its surface.

TABLE III

FRESHLY SURFACED CHROMIUM-NICKEL-IRON VS. MONEL METAL IN FULLY AERATED 5% $H_2SO_4$

Area monel metal disc: 0.150 sq. dm.
Area chromium-nickel-iron sheet: 0.270 sq. dm.
External resistance: 0.47 ohm.
Temperature: 30°C.
Velocity of motion of test pieces: 15.3 ft. per min.

| Time from start in minutes | Anode | Current in amperes |
|---|---|---|
| 0 | chromium-nickel-iron | 0.00600 |
| 30 | chromium-nickel-iron | 0.00380 |
| 60 | chromium-nickel-iron | 0.00310 |
| 1020 | Monel metal | 0.00012 |
| 1080 | Monel metal | 0.00012 |
| 1140 | Monel metal | 0.00012 |
| 1140 | Monel metal | Open circuit voltage 0.135 volt |

The data recorded in Table III show the readings of current flow made in a preliminary test in which freshly surfaced chromium-nickel-iron was coupled with Monel Metal. The current flow was initially quite large with the iron alloy anodic. The next morning the galvanic current was found to be flowing steadily in the opposite direction and an open-circuit potential measurement showed the chromium-nickel-iron to be cathodic to the Monel Metal by 135 millivolts.

By permitting the chromium-nickel-iron to remain in the acid solution for a period of 24 hours before coupling it with Monel Metal it was possible to obtain a more nearly quantitative idea of the behavior of the iron alloy as cathode and to compare it with the behavior of a noble metal. This was done in the test represented by Table IV. The results show that there was considerably less galvanic corrosion in the couple with the iron alloy as cathode than in the couple with the platinum cathode. This may have been due to a failure of the chromium-nickel-iron to retain a completely passive surface, to differences in some property connected with hydrogen overvoltage on that metal or possibly to both these factors. Attempts were made to determine the hydrogen overvoltage of the iron alloy in acid solutions. These attempts failed because the deposition of hydrogen at an appreciable rate upon its surface rendered it active so that its potential became quite basic. At the same time its surface became roughened by corrosion thus rendering it useless for the purpose in mind.

TABLE IV

GALVANIC COUPLES IN FULLY AERATED 5% SULPHURIC ACID SOLUTION

Velocity of motion of Anode and Cathode: 15.3 ft. per min.
External resistance: 0.1 ohm.
Temperature: 30°C.

| Experiment | 1 | 2 |
|---|---|---|
| Anode | Monel Metal | Monel Metal |
| Cathode | Chromium-Nickel-Iron | Smooth Platinum |
| Anode area | 0.154 sq. dm. | 0.156 sq. dm. |
| Cathode area | 0.264 sq. dm. | 0.268 sq. dm. |
| Current at time 0 minutes | 0.00004 amp. | 0.00402 amp. |
| 30 | .00003 amp. | .00109 amp. |
| 60 | .00003 amp. | .00100 amp. |
| 90 | .00002 amp. | .00084 amp. |
| 120 | | .00080 amp. |
| 150 | .00005 amp. | .00077 amp. |
| 180 | .00007 amp. | .00070 amp. |
| 1200 | .00036 amp. | .00065 amp. |
| 1230 | .00036 amp. | .00065 amp. |
| Open circuit potential at 1230 minutes | 0.044 volt | 0.106 volt |
| 1260 | .111 volt | .620 volt |
| Anode weight loss | | |
| Total corrosion | 42.4 mg. | 49.1 mg. |
| Normal corrosion | 33.7 mg. | 34.2 mg. |
| Galvanic corrosion | 8.7 mg. | 14.9 mg. |
| Equivalent galvanic current. | 0.00038 amp. | 0.00065 amp. |
| Ratio galvanic to normal corrosion* | 0.26 | 0.45 |
| Ratio cathode to anode area | 1.71 | 1.72 |

* Current flowed only 1230 minutes.

### Tests in Sulphite Liquors

The valve bronze was chosen as a convenient and representative material with which to couple chromium-nickel-iron in sulphite liquors in order to learn something concerning its behavior in such solutions. Qualitative observations showed that freshly surfaced specimens of the iron alloy behaved erratically for a time but always tended to become passive and to remain in that condition unless their surfaces were violently disturbed. A set of readings showing the variation of the open-circuit potential between valve bronze and the chromium-nickel-iron with time is included in Table V. In this test a practically constant potential in the direction iron alloy cathodic was reached in about 60 minutes although the direction of the potential was initially just opposite.

The observed tendency for the chromium-nickel-iron to become active when its surface was abraded should be borne in mind in applying the alloy commercially. A part which is abraded frequently in service might be kept in the active condition and corrode rapidly. When properly employed the alloy remains passive, so that it was decided that greater interest attached to the behavior of chromium-nickel-iron as cathode in sulphite liquors than as anode. It was found that merely permitting the pieces to stand exposed to air for 24 hours sufficed to eliminate their initial activity in sulphite solutions.

In order to maintain a concentration of free sulphur dioxide in the sulphite liquors of the same order as is present in practice, yet without complicating the design of the corrosion apparatus, sulphur dioxide gas was simply bubbled through the solutions. At a temperature of 50 deg. C. the solubility of sulphur dioxide is approximately 40 grams per liter which is in the desired range.

TABLE V

OPEN CIRCUIT VOLTAGES BETWEEN FRESHLY SURFACED CHROMIUM-NICKEL-IRON AND VALVE BRONZE IN $SO_2$ SATURATED RECLAIMED ACID

Temperature: 46°C.
Velocity of motion of test pieces: 16 ft. per min.

| Time from start in minutes | Anode | Volts |
|---|---|---|
| 1 | Chromium-Nickel-Iron | 0.0065 |
| 2 | Valve Bronze | 0.0120 |
| 3 | " " | 0.0258 |
| 4 | " " | 0.0306 |
| 5 | " " | 0.0386 |
| 8 | " " | 0.0608 |
| 13 | " " | 0.0804 |
| 18 | " " | 0.0925 |
| 28 | " " | 0.1049 |
| 38 | " " | 0.1163 |
| 48 | " " | 0.1253 |
| 60 | " " | 0.1340 |
| 1140 | " " | 0.1421 |
| 1200 | " " | 0.1370 |
| 1260 | " " | 0.1401 |

TABLE VI
GALVANIC COUPLES IN TOWER ACID SATURATED WITH SULPHUR DIOXIDE AT 50°C. AND ATMOSPHERIC PRESSURE

Velocity of Motion of Anode and Cathode: 16 ft. per min.
Duration of test: 20 hours.
External Resistance: 1.00 ohm.

| Experiment | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| Anode | Valve Bronze | Valve Bronze | Valve Bronze | Valve Bronze |
| Cathode | Smooth Platinum | Chromium-nickel-iron | Smooth Platinum | Chromium-nickel-iron |
| Anode area | 0.153 sq. dm. | 0.155 sq. dm. | 0.152 sq. dm. | 0.152 sq. dm. |
| Cathode area | 0.413 sq. dm. | 0.429 sq. dm. | 0.413 sq. dm. | 0.429 sq. dm. |
| Temperature | 50—55°C. | 50—55°C. | 50—55°C. | 50—55°C. |
| Total $SO_2$ at end | 5.53% | 5.53% | 5.03% | 5.27% |
| Free $SO_2$ at end | 4.27% | 4.27% | 3.81% | 3.86% |
| Current reading at time 0 min. | 0.000160 amp. | 0.000030 amp. | 0.000273 amp. | 0.000126 amp. |
| " " " " 30 " | 0.000120 amp. | 0.000020 amp. | 0.000191 amp. | 0.000089 amp. |
| " " " " 60 " | 0.000120 amp. | 0.000020 amp. | 0.000175 amp. | 0.000088 amp. |
| " " " " 90 " | ..... | ..... | 0.000176 amp. | 0.000088 amp. |
| " " " " 120 " | ..... | ..... | 0.000176 amp. | 0.000091 amp. |
| " " " " 1020 " | 0.000190 amp. | 0.000070 amp. | ..... | ..... |
| " " " " 1050 " | 0.000200 amp. | 0.000070 amp. | ..... | ..... |
| " " " " 1080 " | 0.000210 amp. | 0.000100 amp. | ..... | ..... |
| " " " " 1110 " | 0.000220 amp. | 0.000120 amp. | 0.000272 amp. | 0.000107 amp. |
| " " " " 1140 " | 0.000230 amp. | 0.000130 amp. | 0.000272 amp. | 0.000130 amp. |
| " " " " 1170 " | 0.000230 amp. | 0.000140 amp. | 0.000271 amp. | 0.000130 amp. |
| " " " " 1200 " | 0.000230 amp. | 0.000150 amp. | 0.000270 amp. | 0.000139 amp. |
| Open circuit potential at end of test | ..... | ..... | 0.195 volt | 0.183 volt |
| Cathode weight loss * | ..... | 0 mg. | ..... | 0 mg. |
| Weight loss of anode | 64 mg./sq. dm./day | 36 mdd. | 66 mdd. | 44 mdd. |
| Total corrosion | 8.2 mg. | 4.7 mg. | 8.4 mg. | 5.6 mg. |
| Normal corrosion | 2.5 mg. | 2.5 mg. | 2.5 mg. | 2.5 mg. |
| Galvanic corrosion | 5.7 mg. | 2.2 mg. | 5.9 mg. | 3.1 mg. |
| Equivalent galvanic current | 0.000125 amp. | 0.000048 amp. | 0.000129 amp. | 0.000068 amp. |
| Ratio galvanic to normal corrosion | 2.28 | 0.88 | 2.36 | 1.24 |
| Ratio cathode to anode area | 2.70 | 2.77 | 2.72 | 2.82 |

* Uncoupled chromium-nickel-iron showed no weight loss.

It is to be noted that sulphite liquors are unstable so that some change in the composition of the solution used probably occurred with age.

### Fresh Tower Acid

The behavior of chromium-nickel-iron in fresh tower acid when coupled with valve bronze was compared directly with that of platinum in the tests of Table VI. The relative behavior of these cathodes was similar to that observed in dilute sulphuric acid solution which has already been described. Experiments 1 and 2 reported in Table VI were run side by side at exactly the same temperature and with solutions of the same age, hence are directly comparable. The same is true of experiments 3 and 4. Considerably greater galvanic corrosion occurred with platinum as the cathode than with chromium-nickel-iron just as was observed when these materials were coupled with Monel Metal in dilute sulphuric acid solution.

The explanation for this behavior cannot yet be given with certainty. It seems likely, however, that the chromium-nickel-iron remained more noble in the tower acid than it did in the sulphuric acid solution. If this were indeed true, then the discrepancy between the currents with the two cathode materials was probably due to differences in the hydrogen overvoltage of the cathodes. This indicated a cathodic process in which the formation of hydrogen molecules play a considerable part.

The increase in the corrosion rate of the bronze due to galvanic coupling with platinum was nearly in proportion to the added cathode area. This would seem to indicate that the hydrogen overvoltage of the smooth platinum was of the same order of magnitude as that of the corroding valve bronze. The increase in corrosion rate of the bronze when coupled with chromium-nickel-iron was less than half that with platinum, being equivalent to only about 38 per cent for equal cathode and anode areas.

### Reclaimed Acid

In tests with reclaimed acid instead of the tower acid quite different results were obtained. The data for these experiments are given in Table VII. Again the first two experiments were performed together, as were the other two. It will be observed that the galvanic corrosion of the bronze was the same within the limits of experimental error whether the chromium-nickel-iron or the platinum was used as cathode. In each case the rate with the iron alloy was slightly greater than that with the platinum but the difference was so small that no significance can be

TABLE VII
GALVANIC COUPLES IN RECLAIMED ACID SATURATED WITH SULPHUR DIOXIDE AT 50°C. AND ATMOSPHERIC PRESSURE

Velocity of Motion of Anode and Cathode: 16 ft per min.
Duration of Test: 20 hours.
External Resistance: 1.00 ohm.

| Experiment | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| Anode | Valve Bronze | Valve Bronze | Valve Bronze | Valve Bronze |
| Cathode | Smooth Platinum | Chromium-Nickel-Iron | Smooth Platinum | Chromium-Nickel-Iron |
| Anode area | 0.154 sq. dm. | 0.153 sq. dm. | 0.153 sq. dm. | 0.154 sq. dm. |
| Cathode area | 0.413 sq. dm. | 0.430 sq. dm. | 0.424 sq. dm. | 0.429 sq. dm. |
| Temperature | 50—55°C. | 50—55°C. | 46—50°C. | 46—50°C. |
| Total $SO_2$ at end | 3.22% | 3.15% | 3.68% | 4.07% |
| Free $SO_2$ at end | 2.77% | 2.70% | 3.28% | 3.55% |
| Current reading at time 0 min. | 0.000683 amp. | 0.000061 amp. | 0.000230 amp. | 0.000111 amp. |
| " " " " 30 " | 0.000677 amp. | 0.000037 amp. | 0.000392 amp. | 0.000561 amp. |
| " " " " 60 " | 0.000757 amp. | 0.000593 amp. | 0.000464 amp. | 0.000682 amp. |
| " " " " 90 " | 0.000835 amp. | 0.000699 amp. | 0.000536 amp. | 0.000726 amp. |
| " " " " 120 " | ..... | ..... | 0.000536 amp. | 0.000777 amp. |
| " " " " 1050 " | 0.001120 amp. | 0.001401 amp. | 0.000696 amp. | ..... |
| " " " " 1110 " | 0.001085 amp. | 0.001060 amp. | 0.000737 amp. | 0.000808 amp. |
| " " " " 1140 " | 0.001117 amp. | 0.001060 amp. | ..... | 0.000808 amp. |
| " " " " 1170 " | 0.001157 amp. | 0.001105 amp. | 0.000953 amp. | 0.000946 amp. |
| " " " " 1200 " | 0.001199 amp. | 0.001134 amp. | 0.000874 amp. | 0.000937 amp. |
| Open circuit potential at end of test | 0.172 volt | 0.184 volt | 0.142 volt | 0.154 volt |
| Cathode weight loss* | ..... | 0. mg. | ..... | 0 mg. |
| Weight loss of anode | 375 mg./sq. dm./day | 412 mdd. | 285 mdd. | 321 mdd. |
| Total corrosion | 48.1 mg. | 52.5 mg. | 36.4 mg. | 41.2 mg. |
| Normal corrosion | 8.8 mg. | 8.8 mg. | 8.8 mg. | 8.8 mg. |
| Galvanic corrosion | 39.3 mg. | 43.7 mg. | 27.6 mg. | 32.4 mg. |
| Equivalent galvanic current | 0.000859 amp. | 0.000955 amp. | 0.000603 amp. | 0.000708 amp. |
| Ratio galvanic to normal corrosion | 4.47 | 4.97 | 3.14 | 3.68 |
| Ratio cathode to anode area | 2.68 | 2.81 | 2.77 | 2.77 |

* Uncoupled chromium-nickel-iron showed no loss in weight.

attached to it. This agreement of corrosion rates with the two cathode materials indicated that a different type of depolarization of the cathode hydrogen atoms obtained in the reclaimed acid solution than in the tower acid. By analogy with the corrosion tests in sodium sulphate solution removal of the cathode hydrogen atoms probably took place through the action of an oxidizing agent. What agent this may have been will be left to any interested paper technologist to declare. It is possible that sulphurous acid was the depolarizer, aided by some other constituent of the reclaimed acid.

If the ratio of galvanic corrosion rate to normal rate be compared with the cathode to anode area ratio it will be observed that the galvanic current was from to 10 to 80 percent greater than what would be expected. A reason for this discrepancy undoubtedly lies in an uncertainty in regard to the correct value of the normal corrosion rate of the bronze in the reclaimed acid solution. Whereas no difficulty had been experienced in obtaining good agreement between observed values of normal corrosion rate in the other solutions, the corresponding results in the reclaimed acid varied widely. The thin film of corrosion products which formed on the bronze in these tests was of quite different appearance with successive pieces under test. The results of normal corrosion tests in the reclaimed acid were as follows:

70.6, 20.4, 148.7, and 34.0, average 68.4, mg. per sq. dm. per day. It was the average value which was used in the data of Table VII. Possibly with the type of film produced in the galvanic tests the normal rate was higher than this average value.

### Discussion of Field Test

Comparison of the magnitude of the corrosion rates of the valve bronze in the field tests with those in the laboratory tests shows that the conditions of the latter were not as severe as those in the field. It would be merely inviting trouble to assume that the single set of measurements made in the field test were free from considerable variation in the condition of test and to hazard opinions concerning differences between these results and those of the laboratory tests. The increases in rate of corrosion of the coupled over the uncoupled bronzes were comparable to the laboratory results in tower acid rather than in reclaimed acid, although the digester liquor contained 30 per cent reclaimed acid. The recorded decrease in corrosion rate of brass upon coupling with the iron alloy can only be due to some uncontrolled variation in the corrosive conditions. The chromium-nickel-iron was not corroded, so that it could not have been functioning as anode in this couple and thus have protected the brass.

The open circuit potentials of the couples used in the field test were determined in reclaimed acid at 50 deg. C. in the laboratory and were found to be as follows at the end of 20 hours exposure to the liquor (the anode is named first in each couple):

| | | | |
|---|---|---|---|
| Nickel bronze | vs. | chromium-nickel-iron | 0.160 volt, |
| Brass | vs. | chromium-nickel-iron | 0.152 volt, |
| Valve bronze | vs. | chromium-nickel-iron | 0.140 volt. |

### Summary

It was demonstrated that chromium-nickel-iron can function as cathode in galvanic couples in neutral and in acid solutions without destruction of the surface film which renders it passive in these electrolytes. Mechanical and other disturbance of the surface of this alloy rendered it active, at least temporarily, in which condition it behaved more nearly like iron than like a noble metal.

Iron coupled with chromium-nickel-iron in sodium sulphate solution suffered just the same amount of galvanic corrosion as it did when coupled with platinum.

In sulphite liquors, freshly surfaced chromium-nickel-iron behaved erratically for a time but always tended to become passive, to behave like a noble metal and to remain in that condition until its surface was again abraded. The behavior of couples in which a valve bronze was connected with the iron alloy or with platinum indicated that the corrosion process was different in tower acid from that in reclaimed acid. The test conditions were somewhat different from plant conditions in that these solutions were saturated with sulphur dioxide at 50 deg. C. and atmospheric pressure.

In reclaimed acid the corrosion of valve bronze was accelerated to the same degree when it was coupled with chromium-nickel-iron as with platinum. This indicated that the corrosion process involved to a predominating extent the reaction of some depolarizing agent active in this solution.

In tower acid the corrosion of valve bronze was accelerated much less by coupling it with the iron alloy than by coupling it with platinum. A similar result was obtained in pure dilute sulphuric acid solution. The discrepancy is thought to be the result of a difference between the hydrogen overvoltages of the two cathode surfaces.

### Acknowledgment

Grateful acknowledgment is made to Messrs. J. D. Miller, of the York Haven Paper Company, and O. B. J. Fraser, of the Research Laboratory, International Nickel Company, Inc., for their co-operation and helpful suggestions.

# Copper Pipe Advantages in the Paper Industry

By Charles A. Hill[1] and Leland T. Summers[2]

The corrosion resisting properties of copper are well known and this assertion is particularly true at the present time owing to the intensive efforts of various fabricators of this metal to place its general good qualities in this respect before the public. It is, moreover, one of the best corrosive resistant elements that can be secured in quantities.

Copper, at the present time, may be said to be entering an era of great industrial expansion and will be increasingly used as liquid conductors during the coming years. There is many evidences of its long life and enduring qualities. There is still in existence copper pipe that was used in ancient Egypt for conveying water 5400 years ago. In spite of the passage of nearly 60 centuries this pipe remains in good condition and could still be used for the purposes it was originally intended to serve.

Iron, in its various forms, has of course enjoyed general acceptance primarily because of its low initial cost. The great detriment to the use of iron is its susceptibility to corrosive action.

Corrosion in iron or steel pipe begins when it is installed and produces rust which either clings to the interior of the pipe or is carried along by the water, eventually staining substances with which it comes in contact.

It is interesting to note that iron rust occupies, conservatively, ten times as much space as metallic iron. When rust clings to the inside of the pipe it does not take long to plug it. For example, when 1/27 inch corrosion takes place in the inside of a 1½ inch pipe, it will completely clog the pipe with rust unless it is carried away by the water. The smaller the pipe the quicker the action, a 1 inch pipe requires only 1/40 inch corrosion to fill it with rust.

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Contribution of the Materials of Construction Committee.
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Galvanized iron and steel pipe, although low in initial cost, are subject to corrosion and are relatively short lived.

In some cases where initial expense is not one of the governing factors, brass pipe has been used to good advantage and authentic records show that it has been installed for at least fifty years under conditions which would have completely destroyed iron or steel pipe in three or four years. Some objections to brass pipe are: 1. High cost, primarily owing to the fact that its wall must be of sufficient thickness to take a full thread, which adds to its weight and proportionately affects the cost. 2. Brass pipe contains a percentage of zinc and under certain conditions is subject to what is termed "dezincification" and when this action takes place the remaining copper is left in a porous condition and 3. Stresses and strains are not always removed from brass pipe in its fabrication and this is a potential source of what is commonly called "season cracking."

Copper has always been considered the ideal material for many liquid conductors but until comparatively recent years its cost for this purpose was commercially prohibitive. This was chiefly owing to the fact that there had not yet been devised a method for connecting copper pipe that did not require a thread. To connect pipe by threading, its wall must be of sufficient thickness to permit a thread to be cut and this, of course, weakens it at this particular point, while the surplus thickness on the unthreaded length of the pipe then becomes simply excess material which has to be paid for originally, simply because a very small portion of it must be thick enough to fabricate the thread. Threading is, of course, the common method now in use for connecting iron or brass pipe.

The problem in putting copper on the market for ordinary commercial use from a cost standpoint, was to devise a method of connection that did not require a thread so that a lighter wall pipe could be used. A few years ago the Mueller Brass Co. of Port Huron, Michigan, brought out a flared tube fitting which was the first forward step in reducing the wall thickness of copper pipe for general industrial use and it was at once adapted by many waterworks companies as standard.

Further developments, however, were still necessary to place copper on a more competitive basis with iron. In the long run, even at a higher initial cost than iron, copper, owing to its long life and ability to retain its original non-clogging waterway, is, in reality, more reasonable in price. This fact, however, is often overlooked and it was realized that if copper was to be used to any great extent industrially, a further lowering in original cost was necessary. This final handicap has been overcome by the advent of what is known as Streamline hard copper pipe and fittings. This new fitting is threadless and is designed to make a conveniently soldered connection to thin wall copper pipe. The soldering is not done with a soldering iron but by the application of solder wire fed into conveniently placed openings in the fitting by the aid of the blow torch and the natural law of capillary attraction. To make use of this natural law of capillary attraction, close tolerances and clean surfaces are essential. It is interesting to observe that when the solder wire is fed in, it is drawn around evenly in the joint by capillary attraction and appears almost immediately at the outer edge of the fitting, thus indicating that the joint has been completed. When the job cools, a permanently tight joint is affected which, in contrast to all other methods of connecting, is actually stronger than the pipe itself.

Many tests have shown that the pipe, solder and fitting alloy to form a practically solid joint which is of such amazing strength that if the enormous pressure of approximately 9,000 pounds per square inch were exerted upon a ¾ inch joined section, it would result in a fracture of the pipe but not in the joint itself.

Another mechanical feature of this type of joint is the fact that the distance to which the copper pipe may be inserted in the fitting has been carefully determined and made positive by a shoulder in the fitting itself against which the pipe rests. This shoulder is the same thickness as the pipe wall, thus insuring a continuous uninterrupted waterway that cuts flow resistance to a minimum and leaves no obstructions as a starting point for future accumulation.

This material is now available in nominal pipe sizes up to and including 6 inches and has been subjected to severe life tests in paper mills.

One of the difficulties to be overcome in white water systems in sulphite mills is the growth of slime and its adherence to the inner walls of the pipe and connecting fittings with its resultant restriction in delivering capacity by decrease of area. Mill tests have shown that slime will not adhere to the smooth interior of copper pipe. In support of this fact, actual photographs are shown of sections of wrought iron and copper pipe from the same line installed for the same length of time.

Owing to the fact that copper does not corrode or rust the interior of copper pipe is always smooth thereby eliminating the formation of scale and rust particles which otherwise would be dislodged and later appear as minute black specks and blemishes in the finished product. In addition, since there is no anchorage for slime, slime spots are also eliminated. This non-scaling quality of copper pipe admirably suits it for use in blow pits and screen rooms where the air is extremely moist and slightly acid owing to these departments being in close proximity to the digester room and the acid plant. Since screen blow pits and flumes are usually open, copper is most desirable for the reason that no rust particles can possibly form on the exterior of the piping to eventually break loose through vibration and drop into the stock. From all indications the life of copper in these departments will be prolonged indefinitely while ferrous pipe of any sort must be replaced every two or three years. Maintenance cost is considerably reduced and cleaner stock results.

The features previously outlined make copper pipe equally suitable for use in stock lines conveying bleached as well as unbleached pulp. Where color changes are frequent on paper machines, the smooth uninterrupted interior with a complete absence of recess between pipe and fitting in a hard copper pipe installation facilitates ease in wash-ups.

Copper today is almost universally used in showers and as the new hard drawn thin wall copper pipe combines light weight with necessary rigidity, it results in ease in handling when changing felts and wires.

The new threadless fitting with hard thin wall copper pipe has an unique application in calendar stack air blasts as it permits the directing of air upon any point on the calendar rolls by merely slipping together the pipe and fittings. The absence of threads and heavy fittings in a hard copper pipe installation results in a maximum of flexibility while the smooth interior reduces friction and the light weight reduces the hazards in handling.

Since this particular copper piping installation does not require room for wrench grip and swing, in its assembly, but is connected with a fitting very little larger than the pipe itself by means of soldering, it can be used to good advantage in bearing cooling, instrument piping and general water piping around machines. Its neat compact appearance, together with its space saving qualities and great strength make it ideal for this purpose.

For cost comparison purposes we are using the 2 inch size although this material is available up to and including 6 inch.

If we take present day prices per foot of the various kinds of pipe in common use and use the price of hard copper pipe as the unit of comparison we find that

| | |
|---|---|
| Galvanized steel is | 42 per cent less in initial cost |
| Galvanized wrought iron is | 5 per cent more in initial cost |
| Iron pipe size brass pipe is | 100 per cent more in initial cost |
| Iron pipe size copper pipe is | 123 per cent more in initial cost |

In addition of this low initial cost of copper there is a decided salvage value which must be taken into consideration. The joints on a copper pipe installation can be disassembled and reassembled any number of times without loss or scrap and in the event that it is sold for scrap its value is within two cents of the prevailing copper market.

# Methods of Determining Acidity In Paper*

## Report of Sub-Committee on Paper Testing Chemical Methods

The work of this committee for 1930 centered in the cooperative tests made on 6 samples of paper, using four different methods.

Thirteen laboratories agreed to cooperate in this work as follows: American Writing Paper Co., H. U. Kiely; Bureau of Standards, Paper Section, J. O. Burton; Bell Telephone Laboratories, B. L. Clarke; Electrical Testing Laboratories, P. F. Wehmer; General Electric Company (Pittsfield Laboratory), A. L. Allen; Hercules Experiment Station, G. F. Kennedy; A. D. Little, Inc., R. C. Griffin; John A. Manning Paper Co., Inc., E. G. Ham; The Northwest Paper Company, W. F. Hoffman; Oxford Paper Company, H. W. Morgan; Rag Content Paper Manufacturers, J. E. Minor; Rex Paper Company, Harry Bradford; and S. D. Warren Company, E. Sutermeister.

Between 2 and 3 pounds of each of six different papers were obtained from B. L. Wehmhoff of the Government Printing Office for use in the tests, as follows:

1. 100 per cent rag machine finish book
2. 100 per cent rag ledger
3. 50 per cent rag machine finish book
4. White sulphite bond
5. (Dark) kraft wrapping
6. Standard news print

Sufficient quantity of each sample was ground to furnish each laboratory with from 15 to 25 grams of each sample. When grinding, equal quantities of each sheet of sample were taken so that each ground sample as sent to the laboratories represented a complete cross-section of the whole sample. About 500 grams in all of each sample were ground. The samples were sent to the laboratories in 8-ounce screw-capped bottles.

### Methods Used

Each laboratory was asked to test each sample by as many of four different methods of determining acidity, as it was equipped to handle. The methods were as follows:

1. (Slightly modified) Method described in American Society for Testing Materials Tentative Methods for testing untreated Insulating Paper—Serial Designation D202-30T.
2. Kohler-Hall Method.
3. Method proposed by Dr. J. E. Minor.
4. Determination of hydrogen ion concentration of water extract.

Following is a detailed description of each method sent out:

### 1. A.S.T.M. Method—Acidity or Alkalinity

A hot water bath, electric hot plate, motor with stirrer, 50-cc. glass burette graduated to 0.1 cc., 250-cc. wide-mouth Erlenmeyer flasks, thermometer graduated to 1 deg. C., covering the range from 50 to 100 deg. C., and a filtering apparatus, are required for the test.

The Erlenmeyer flasks and the stirrer shall be of acid-resistant and alkali-resistant glass. The stirrer shall consist of a glass shaft, one end of which shall be fitted to a chuck attached to the motor shaft. The other end of the stirrer shall be fashioned into a two-bladed propeller, each blade to be approximately 15 mm.( (0.59 in.) long and 6 mm. (0.24 in.) wide. The pitch of the blades and the direction of rotation shall be such as to produce a downward current along the glass shaft when the stirrer is rotated in the liquid, thus preventing spattering.

The following reagents shall be required: Solutions of sodium hydroxide (NaOH) and sulphuric acid ($H_2SO_4$) in water, each being 0.01 N in strength; solution of 0.5 g. of phenolphtalein dissolved in 100 cc. of c.p. ethyl alcohol.

*Extraction*—One gram of the composite sample shall be placed in a 250-cc. Erlenmeyer flask and 100 cc. of boiling, distilled water added. The flask shall then be clamped in position in a water bath[1] heated to 100 deg. C. on a hot plate. The level of the water in the bath shall be slightly above the level of that in the flask, and the temperature of the contents of the flash shall remain at least as high as 95 deg. C. during the stirring operation. The stirrer shall be mounted so that the blades are within 3 mm. (0.12 in.) of the bottom of the flask and offset from the center in order to obtain best beating action. The stirrer shall be driven at a speed of 4,000 to 5,000 r.p.m. for 5 minutes. At the end of this period the sample should have been thoroughly pulped. For papers unusually difficult to pulp, the period of stirring shall be increased to 10 minutes.[2]

*Titration*—Immediately after the sample has been pulped the contents of the flask shall be filtered rapidly into another 250-cc. Erlenmeyer flask without washing.

NOTES: To find the proper color transformation at the end-point complished as properly as possible after disintegration to prevent re-absorption of acidic or alkaline material from the extract by the pulp as the temperature falls. A convenient method consists of a 25-cc. porcelain Gooch crucible and holder assembly. The pulp forms a filter mat of itself over the perforation in the bottom of the crucible and the first portion of the filtrate is re-filtered to catch the fibers which go through during the formation of the mat.

The filtered extract shall be boiled for 3 minutes and immediately titrated before the temperature falls below 80 deg. C., thus eliminating the error due to dissolved carbon dioxide.

If the extract is acidic, it is titrated with 0.01N NaOH, using 5 drops of the specified phenolphthalein solution as indicator. The end point is determined by the appearance of a definite pink color. If the extract is alkaline, a small excess of 0.01N $H_2SO_4$ is added and the titration then completed with 0.01N NaOH as described above.

NOTES: To find the proper color transformation at the end-point, a blank titration should be made on boiling distilled water under the above specified conditions.

The number of cubic centimeters of titer solution shall be recorded together with the temperature volume of the solution taken immediately upon the completion of the titration as these figures enter into the blank correction for the volume error ($E_v$).

*Blank Correction*—The correction for the blank error in the titration shall be made:

1. By running a blank in parallel with the actual determination using a volume of pure distilled water equal to that of the extract at the end-point.

*Expression of Results*—The results shall be expressed as per cent by weight of $SO_3$ if paper is acidic or as per cent by weight of NaOH, if alkaline.

### II. Kohler-Hall Method

The paper is converted into a cotton-like substance by grinding in some suitable apparatus.

*Extraction*—Five grams of ground paper are transferred to a 500 cc. pyrex glass Erlenmeyer flask and 250 cc. boiling water added in small portions, the flask vigorously shaken with each addition of water, to secure entire soaking of the paper. If the

* Presented at the annual meeting of the Technical Association of the Pulp and Paper Industry, New York, N. Y., Feb. 17-19, 1931.
Contribution of the Paper Testing Committee.

[1] At high altitudes a salt bath will be necessary to obtain the temperature required.

[2] Any other method of pulping the sample as rapidly and thoroughly, while maintaining a temperature of 95 deg. C. within the flask during extraction, should prove satisfactory.

sample to be tested consists of surface sized paper, this is easily done, as the sizing is destroyed by the grinding; in the case of rosin sized paper, however, the soaking requires care, or the paper will remain partially dry, floating on the surface. In this case very littlle water is added at first, and the flask thoroughly shaken until a ball is formed of the stock; then the rest of the water is added.

The flask is provided with a cork and a narrow glass tube of about ¾ meter length, acting as condenser, and the mixture is then heated in a boiling steam bath for exactly one hour, shaking two or three times during this period. When the heating is finished, the extract is drained off on a Buchner funnel, using strong suction. The flask is washed with 10cc. cold water to remove remaining fibers, but no washing of the stock on the filter is permitted. The stock is returned to the flask for two repeated extractions.

*Titration*—Each extract is cooled to room temperature and titrated with n/100 NaOH, using phenolphthalein as indicator.

*Report*—The acidity is to be reported as per cent $SO_3$ by weight of dry paper.

### III. Dr. Minor's Method for Determining the Acidity of Papers

*Method*—One gram of stock or paper, cut or ground, is covered in an Erlenmeyer or suction flask of 250 cc. capacity with 100 cc. of distilled water and boiled for 2 minutes. The flask is then set aside to cool, connected with the sweeping apparatus, swept of carbon dioxide for fifteen minutes and, while continuing a slow sweep, the liquid is titrated with hundredth normal NaOH using phenolphthalein as indicator.

*Sweeping Apparatus*—The sweeping apparatus consists of a tower containing at least one pound of soda lime connected through a six-inch cotton scrubber tube with two gas washing bottles, each containing 150 cc. of distilled water, then with the test flask, then through another gas washing bottle or trap to a water aspirator. Through the stopper of the test flask is inserted the tip of the burette which contains the standard NaOH, thus enabling titration during continued air sweeping.

*Precautions*—To insure the absence of any alkali from the soda lime tower reaching the test flask, it is well to use phenolphthalein in the wash bottles to indicate this alkali. Distilled water will absorb in time considerable alkali from soft glass, but this can easily be dissipated by one drop of hundredth normal acid indicating no error therefrom. The titration flask should be pyrex glass.

The end point with this indicator in the presence of normal air is very fluctuating. After sweeping, it is much more distinct though in the presence of fibers, due to absorption, the initial color fades rather rapidly. There is a first end point when a faint pink pervades the liquid for an instant which with a little experience may be easily duplicated, then there is a second end point where the end point is permanent for at least one minute. In our work we have standardized on the pink color which is permanent for one minute, considering that a mean between neutralizing bound acid radicles and alkali absorption. (A photograph of the apparatus set-up was sent with this method).

### IV. Determination of Hydrogen ion Concentration of Water Extract

*Apparatus*—A hot water bath, an electrically heated hot plate, a motor-driven stirrer; a 25 cc. glass burette graduated to 0.1 cc., 500 cc. Wide mouth Erlenmeyer flasks, thermometers covering the range 50 to 100 deg. C. and suction-applied filtering apparatus are needed. The motor-driven stirring apparatus should develop at least 3,000 r.p.m., 4,000 to 5,000 are more desirable. The stirrer shall be of glass, attached to the rotating shaft by means of a chuck. A two-bladed propellor having glades approximately 15 mm. (0.59 in.) long and 6 mm. (0.24 in.) wide is convenient for use in the regular wide-mouth Erlenmeyer flask. The pitch of the blades, and the rotation of the propellor should be such that when it is rotated in the liquid, a downward current along the glass rod will be produced, thus preventing spattering.

All glass used shall be resistant to alkali and acid. Pyrex glass has been found suitable.

*Extraction*—Five grams of the ground sample shall be placed in a 500 cc. Erlenmeyer flask and 250 cc. of boiling, distilled pH 7 water added. The flask shall then be clamped in position in the hot water bath heated to 100 deg. C. on the hot plate. The level of the water in the bath should be slightly above the level of the liquid within the flask, and the temperature of the flask contents should remain above 95 deg. C. during the extraction. The contents of the flask shall be stirred for 5 minutes. At the end of the stirring period the contents of the flask shall be quickly filtered on a Buchner funnel without filter paper, and without washing, into another 500 cc. flask, and set aside. A "blank" of 250 cc. distilled water shall be run in exactly the same manner as the test containing the paper. Where the size of the water bath and stirring equipment allows the test and the "blank" can be run simultaneously. The filtered extract and the "blank," after boiling for 3 minutes are then stoppered in the flask and allowed to cool to room temperature and the pH value of each determined, using therefore either a colorimetric method or an electrometric method, as equipment allows. Whichever method is used should be described in detail in the report. All tests shall be run in duplicate.

*Report*—The report shall give a detailed description of the method of measurement of pH value, giving results for both "blank" and sample extract. For convenience, the following reference is included: Electrometric Titration—Journal of Industrial and Engineering Chemistry. Vol. 20, July, 1928, pp. 676 to 680—article by H. C. Parker.

The above method covered only the preparation of the water extract. The determination was to be made by either electrometric or colorimetric methods, giving in either case full details of the procedure followed.

As the samples were sent out late in the year not all laboratories have as yet sent in their results. A chart containing the results received up to the time of the convention date will be presented for discussion.

P. F. Wehmer, Chairman.

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## Modern Insulation Materials

Radiation across confined spaces and convection currents in such cells have also to be reckoned with in other phases of high temperature insulation practices, for such phenomena exert much influence upon the success with which heat losses may be controlled. In fact, it is an appreciation and understanding of the laws of heat transference by radiation and convection which distinguishes much of the recent progress in approved methods of heat insulation and even in respect to the characteristics of modern approved insulation materials.

Ordinarily, a material having a low apparent density is considered a good insulator and where only low or moderate temperatures are concerned the insulating properties of most such materials doubtless suffice. Many of these materials contain, however, numerous voids, or cells of relatively large size filled with air and in high temperature insulation there is grave danger of these voids being too large and of having radiation across the spaces and convection currents developed in the cells, a situation which discounts and may even destroy the insulation capacity of the materials for high temperature conditions. Nevertheless, for a material to be effective as an insulating medium at high temperature it must possess marked porosity, but with the individual pores so small that heat radiation within the material will be very limited. If the pores, or cells, are large enough to be noted by the naked eye, they are now held large enough to be instruments of heat transfer by radiation and convection at the temperatures common in modern power plant practice, and the larger the voids, the more rapid is the increase in apparent heat conductivity at elevated temperatures.

Section of the

# COST DEPARTMENT

of the

American Paper and Pulp Association

Edited by T. J. Burke C. A. Director Cost Dept.

# Holds Items of Profit-Loss Character Should Not Be Entered in Surplus*

By H. F. Nicklaus

Prominence is given to the earnings of well-known corporations as announced by officials or taken from periodical reports to stockholders and the public. Earnings frequently are stated in the form of "Earning per Share," which to the layman is the measure by which to determine whether the corporation is earning the dividend it is paying and whether the dividends are likely to be increased or decreased in the near future, with resultant effect upon the market price of the stock. Thus the earnings per share ascertained by the accountant is the point of contact between the accountant and the layman, who represents the average investor and prospective investor.

It is desirable, then, that there be uniform practice among accountants in the computation of earnings per share, instead of the individuality of treatment which is common at present. This individuality is demonstrated in the varying methods of handling the question as to when items of a profit or loss character should be carried directly to surplus account. Accountants agree that there is a line of demarkation as to when items should be carried directly to surplus account and when they should be placed in the profit and loss account, thus entering into the computation of earnings. However, the location of that line of demarkation is a matter of disagreement.

The importance of the question is shown by the following example: A corporation had a loss on the sale of a capital asset of $40,000, while profits from other sources for the period were $100,000. If the loss of $40,000 is carried directly to surplus as being extraneous from the operations for the period, the published earnings will be $100,000, while if it is included in the computation of earnings the published earnings will be $60,000.

A primary consideration is the meaning of the word "earnings." The dictionary defines "earnings" as "gains." It also defines "gains" as "profits"—thus making the words synonymous. However, many accountants believe that in accounting parlance there is a distinction between earnings and profits. The Committee on Terminology of the American Institute of Accountants has suggested the following:

"Earnings"—That which is gained or merited by labor, service, or performance; reward; wages; compensation. The word implies the reward of personal effort as distinct from return upon investment, e.g., in the expression "earned income" or "unearned income." The word is applicable to individuals rather than to corporations, although as applied to the latter it is used by virtue of tax laws synonymously with income.

"Profits"—The gain resulting from the employment of capital in any undertaking; the excess of the selling price over the cost of anything; pecuniary gain in any transaction or occupation; the surplus remaining from the employment of capital after defraying expenses and providing for loss of capital employed.

It is obvious that when the earnings of a corporation are published, in the light of the above definitions, that which is meant is not earnings, but profits. The press and public have used the word representing personal effort, which is more dramatic and easily visualized by the reader, rather than the word for corporate effort.

Most accountants are not confused by the fact that the press uses the word earnings instead of the word profits. The majority of instances which are open to criticism on the ground that incomplete information has been given to the press are not the result of lack of proper accounting knowledge and technique, but of a zeal to please clients.

### Should Not Carry Directly to Surplus Account

If the question of a distinction between the words earnings and profits were laid before the layman, he probably would say, "What does that matter to me? What I want to know is the amount of money the company is making." As that is the information the investor or prospective investor wants and uses, the accountant should give it to him as completely as possible; all items of a profit or loss character should be included in the profit and loss statement, and thereby in the computation of earnings, and nothing should be carried directly to surplus account.

It is true that if items of profit or loss are placed directly in surplus account they may show in the printed report of the corporation distributed to its stockholders, as such a report frequently, but not uniformly, includes an analysis of surplus account. The reader can then draw his own conclusions regarding the earnings. But this is unsatisfactory for two reasons:

1—Many investors and prospective investors do not receive the periodical reports of the corporation, but they read and rely upon press statements which show only the amount of earnings and the amount per share.

2—The periodical reports are not usually delivered to stockholders until some time after the amount of earnings has been released to the press. In some cases these reports are annual only, whereas the published earnings are quarterly.

### Would Puzzle Readers

It is also true that the amount of earnings as released to the press could be the total of the profit and loss statement and the

* The American Accountant.

profit or loss items in surplus, but such a procedure would cause numerous inquiries from puzzled readers.

Consequently, the surplus account, with two exceptions, should consist of only two items during the accounting period—a credit of net profits (or a debit if there is a loss) and a debit of dividends. All other transactions which have brought changes in the net worth should be carried through the profit and loss statement.

### One of the Exceptions

One of the exceptions is the placing on the books of an appraisal of capital assets, or a valuation of good-will. When an appraisal is placed on the books it means that a value has been put on the assets which has not been realized by a sale. Until a sale has been consummated any excess of appraised value over cost would have no place in the profit and loss statement, and it should properly go directly to surplus, although it should be earmarked as a capital surplus and shown separately from earned surplus. Likewise a reduction in the excess of appraised value over cost at some subsequent date would be debited to capital surplus. The same principle applies to placing of good-will on the books when it has not been purchased.

The other exception is transactions of the company in its own stock. Such transactions are only a change in the capital structure, and therefore should not enter into a computation of earnings. These items may occur in several ways, the five most common being as follows: (In each case the entries should go direct to surplus).

### Transactions of Company in Own Stock

1—When stock is issued at a premium above par.

2—When it is necessary for stockholders to pay an assessment or to have the par value of their stock reduced.

3—When the company purchases its stock above par or below par.

4—When stock is donated for the purpose of resale, thereby providing working capital. (This also covers donations of assets received by the company).

5—When stockholders have to convert their class of stock into another class of a lesser amount.

| | | |
|---|---|---|
| Gross sales | $..... | |
| Less: Returns and allowances | ..... | |
| Net sales | | $..... |
| Deduct: Cost of goods sold | | ..... |
| Gross profit | | ..... |
| Deduct: Selling expenses | $..... | |
| General and administration expenses | ..... | ..... |
| Net profit from operations | | ..... |
| Add: Other income | | ..... |
| Deduct: Interest and discount | | ..... |
| Net profit from management | | ..... |
| Add: Extraordinary profits (detailed) | | ..... |
| | | ..... |
| Deduct: Extraordinary losses (detailed) | | ..... |
| Net Profit carried to balance sheet | | ..... |

(Suggested Form of Profit and Loss Statement, to Show Extraordinary or Unusual Profits or Losses)

The chief objection to the doctrine of including all profit or loss transactions in the profit and loss statement is that it will render the profit and loss statement of little value as a medium of comparison between years. The skeleton form of profit and loss statement shown is designed to meet this difficulty.

In this skeleton form the items which would distort the profit and loss statement as regards annual or periodical comparisons, because they are not recurring in the ordinary course of business, are placed in the last section of the statement below the net profits from management. Therefore when making comparisons the net profits from management could be used and all such extraordinary items would be automatically eliminated. These items are called extraordinary profits or losses because they are outside of the regular efforts of the management and also of an unusual and non-recurring nature. They are the items which are sometimes placed directly in the surplus account and thereby excluded from the profit and loss statement, and the computation of earnings per share. Examples are as follows:

1—Profit or loss on sale or disposal of capital assets.

2—Items applicable to profit and loss of prior years which have come to light only in the current year through discovery of error or other causes.

3—Extraordinarily large outlays for experimentation or development which cannot be capitalized because no asset of corresponding value has resulted therefrom.

Transactions of this character cause just as much change in net worth as if they occurred in the routine of business, and the fact that they are unusual is not sufficient reason for excluding them from computations of earnings as given out to the press.

Returning to the illustration wherein the company has profits from management of $100,000, but a loss on a sale of a capital asset of $40,000, to release to the press the information that the company had earnings of $100,000 would be incomplete. Information that the earnings were $60,000 would also be incomplete. The investor or prospective investor is entitled to know that the company had earnings from management of $100,000, and also a loss on sale of capital asset of $40,000. The knowledge that the company earned $100,000 from management gives the investor something by which to estimate future profits of the company. On the other hand, the capital loss of $40,000 means a reduction in the sum available for dividends.

Consequently, it is believed that accountants should bend their efforts to the end of discontinuing the placing of items of a profit or loss character in the surplus account, as they are thereby eliminated from published computations of earnings. The protection of the investor is of paramount importance if the good name of the profession is to continue and increase.

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## Evergreen Paper Products Price List

The new Evergreen Paper Products price list and catalog just issued by the Hoberg Paper and Fibre Company, Green Bay, Wis., is one of the most comprehensive, convenient and attractively executed lists that has ever been distributed in the paper trade.

This book is a loose-leaf affair, which permits easy elimination of old pages or the insertion of new pages—the total number of pages not including front and back pages is 47. It has a green finish rippled combination cover with a simple yet striking design stamped in genuine gold leaf.

The pages are printed on one side only and each page is confined to one product or grade. Products as well as various styles and grades are identified by item number as well as by trade name. This manner of listing not only simplifies matters, but reduces confusion and opportunities of error to the least possible minimum.

To illustrate the system of number, the following is outlined:—

"The towels which are in the front of the book start out with the number 100 and go as far as 115. This means that when we see an order coming through with the number 100 and including any other number up to 115, we know even before looking at the trade name that the customer is talking about towels.

"The cabinets then start with the number 115 and go as far as 120. Folded toilet tissues follow next. They are allowed the numbers starting with 200 to 210, the cabinets then follow with numbers 215 to 230 and so on down the line to the very end of the price list: each particular kind, grade and style of product is allowed its own classification and number, which makes them easy to be identified, as well as to be listed properly on orders or in correspondence.

"Products and labels are duplicated in their actual colors and eight distinct colors were used to illustrate and print each individual product."

# New Pulp and Paper Mill Equipment

## Lewellen Jordan Control Systems

The Lewellen Manufacturing Company, of Columbus, Ind., is the manufacturer of the Lewellen variable speed transmission and controlling devices, and also the Harvey-Lewellen automatic thickness control system for paper machines. The close relations of the organization to the paper industry led to it undertaking the development of a control which would automatically maintain a uniform hydration of the paper fibers by controlling the Jordan. The matter

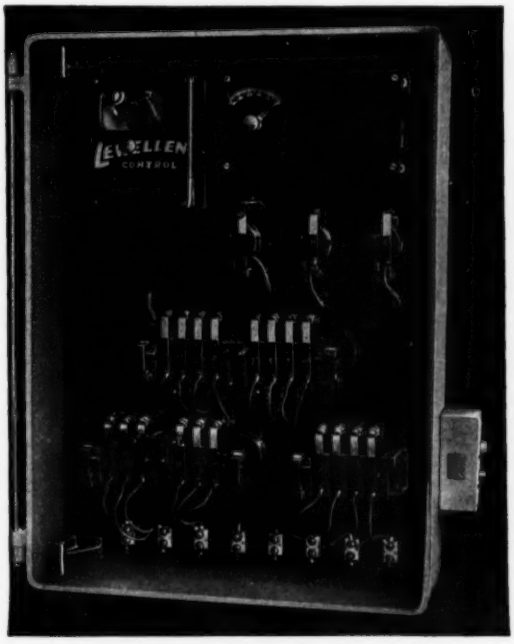



FIG. 4.

was discussed with a great many paper mill operators, and as a result of these serious discussions the company undertook to develop the Lewellen Jordan Control System a number of years ago.

About two years ago the company considered that it had reached its perfected stage. At that time it was determined not to make a public announcement until this perfected design had been in use about two years. This perfected design has now been in operation controlling Jordans under

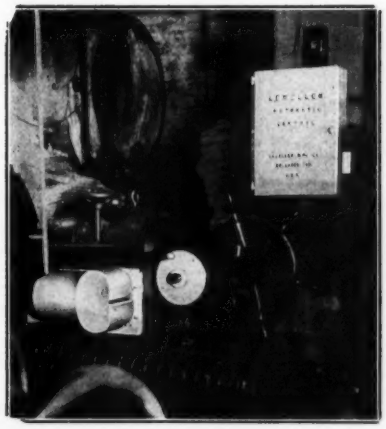


FIG. 5.

continuous 24-hour service for about 22 months. There have been no interruptions whatever, due to failure or defects in the Lewellen Jordan control. The Lewellen Manufacturing Company, therefore, feels perfectly safe in announcing this to the trade, and is prepared to furnish this equipment to control any motor driven Jordan.

In undertaking this development, the company first developed a special form of ammeter which is used in the circuit with the Jordan motor. Later it was determined to discard the ammeter and instead use a wattmeter movement because some inaccuracies were encountered due to variations in the voltage of some paper mill circuits. With the wattmeter which is now used, variations in the line voltage in a mill do not affect the accuracy of the Lewellen control. Another difficulty encountered was the welding of the contact points in the ammeter. Means of overcoming this welding action were devised so that as the Lewellen Jordan control system is now built, it is absolutely impossible for the contacts to weld.

Figure 1 shows the wattmeter with the cover removed. There is a small 6-volt lamp located permanently on the inside of this wattmeter case, the light burning continuously while the control is in operation. This makes it possible to make accurate adjustments on a wattmeter at any time. By turning the screw "A" figure 1, the wattmeter control is set to maintain any predetermined load. It can be changed to any other load by simply turning screw "A" until the pointer travels across the scale to a new reading.

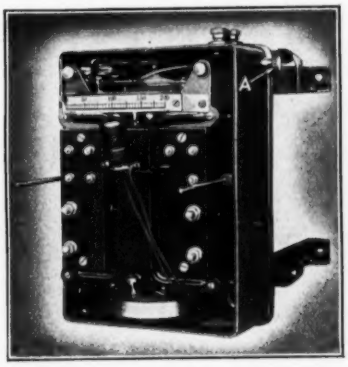



FIG. 1.

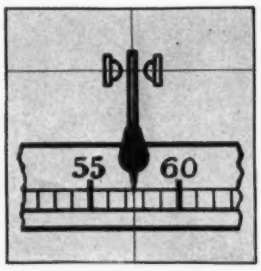



FIG. 2.

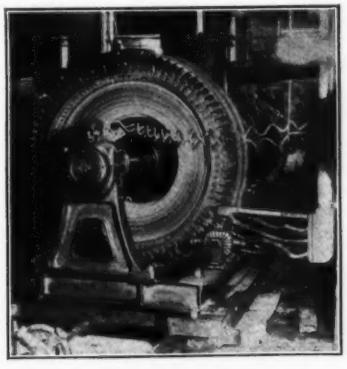


FIG. 3.

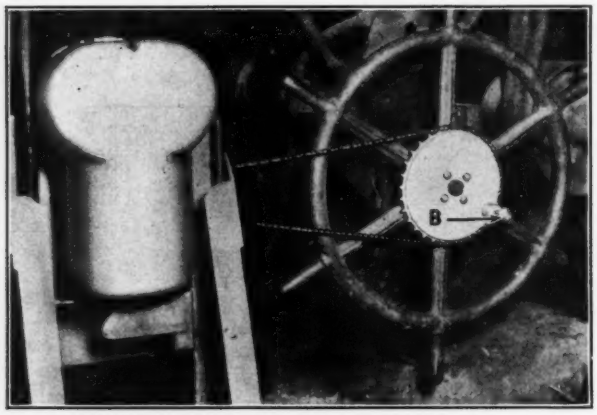



FIG. 6.

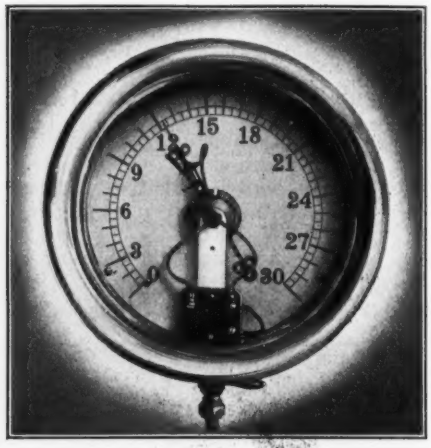



FIG. 7.

Figure 2 illustrates the arrangement of the contacts in the wattmeter. The wattmeter is equipped with an oil check which prevents vibration of the wattmeter pointer. The current transformer, figure 3, is installed in series with two of the phases of the Jordan motor; secondary terminals of this current transformer, of course, being connected to the wattmeter. Control cabinet, figure 4, encloses the controller relays, various switches required to operate the Jordan control mechanism.

Figures 5 and 6 illustrate two installations. In figure 5 the motor unit which operates the Jordan plug adjusting screw is mounted on the Jordan frame. Figure 6 illustrates a different type of Jordan showing motor unit standing to one side of the plug adjusting screw hand wheel. All installations are arranged so that the Jordan plug can be operated by hand by simply operating the pull out pin as shown in "B", figure 6.

Figure 7 illustrates the vacuum gauge control which will be used where it is desired to maintain a uniform vacuum on the suction boxes of a fourdrinier machine. Figure 8 is a diagrammatical arrangement of the various units of the Lewellen Jordan control. No attempt has been made in this figure to show the exact wiring of the units, the intention only being to show the general grouping of the parts.

All the work of installing a Lewellen Jordan control can be done while the Jordans are in operation, the electrical connections to the main Jordan motor being made over some week-end, or when the Jordan is not in operation.

Limit switches are provided to protect the Jordan and stop operation of the Jordan control when the plug reaches a predetermined position in either direction. After the Lewellen Jordan Control System has been installed, the Jordan plug is set by hand to produce the proper stock hydration. The contacts in the wattmeter are then set by turning screw "A," figure 1, until the contacts are in position shown in figure 2. The Lewellen Jordan control is then set and ready to be put into operation by pressing the start button on the side of the control cabinet, shown in figure 4. Thereafter, the Lewellen Jordan control system automatically maintains this hydration of the stock fibers by continuously adjusting the Jordan plug to compensate for any changes in the stock reaching the Jordan.

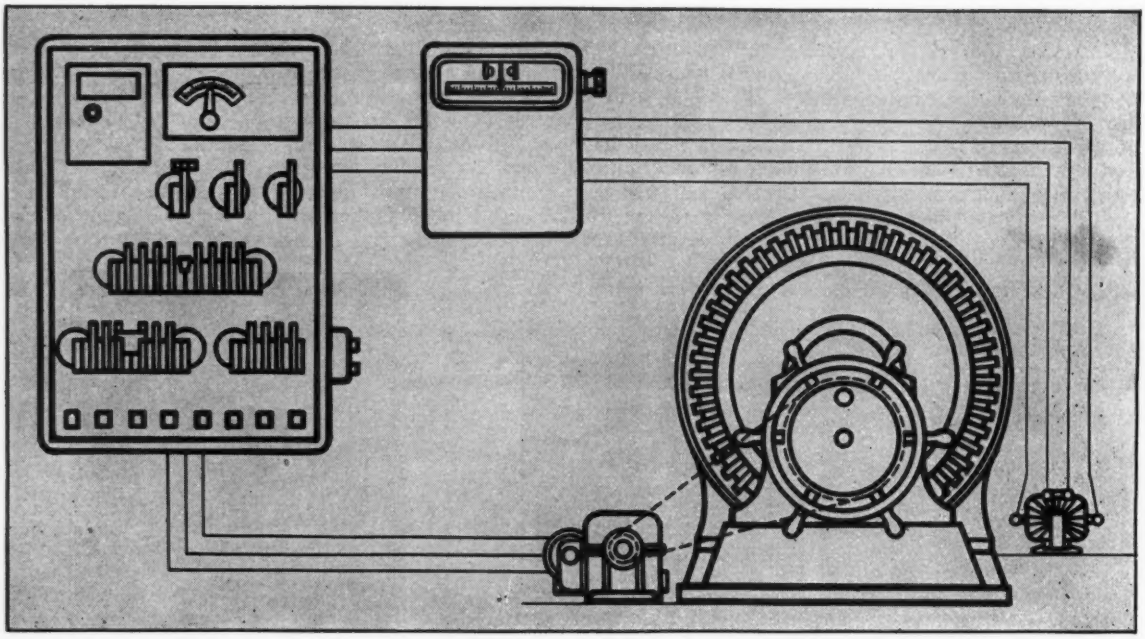


FIG. 8.

The controller illustrated in the upper right hand corner of the cabinet, figure 4, consists of a contact engaging mechanism in which the interval between the contacts and also the length of time the contacts are in engagement, are adjustable.

Experience so far has shown that an interval of 10 seconds between contacts and a duration of the engagement of the contacts of 1 second, produces very satisfactory results. This means that once every 10 seconds the control circuit through the controller, will be closed and if at the same time two of the contacts in the wattmeter are in engagement, a slight adjustment will be made on the Jordan plug. This continues indefinitely as long as the wattmeter pointer contact is in engagement with either the high or low contact illustrated in figure 2. No adjustments are made at the Jordan plug except when either the high or low limit contact, figure 2, is in engagement, even though the controller contacts are brought into engagement at regular intervals.

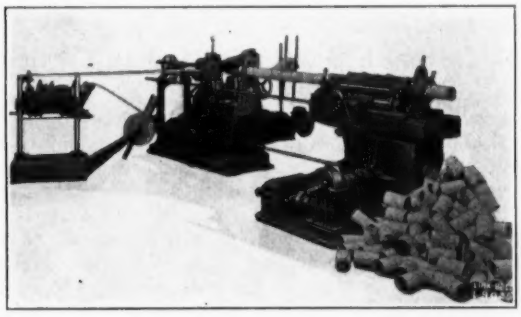
## Improved Paper Stock Pump Bulletin

Allis-Chalmers Manufacturing Company has just published a revised edition of its bulletin on "The Improved Paper Stock Pump." The pumps are comprehensively described and profusely illustrated in this attractive booklet. Considerable power in a mill is consumed in pumping stock in the manufacture of paper. This can be reduced by efficient stock pumps, if they will also handle the higher percentages of stock. The improved new design Allis-Chalmers stock pump accomplishes both of these results. Moreover, the design has been worked out and based on experience extending over a long time and proved by recent extensive tests pumping stock.

## Imperial Paper & Color Corp. Elects Officers

[FROM OUR REGULAR CORRESPONDENT]

HUDSON FALLS, N. Y., April 14, 1931—A reorganization of the executive staff of the Imperial Paper and Color Corp. was effected at a meeting of the board of directors. Karl R. McBride was chosen president to fill the position made vacant by the recent death of Louis M. Brown and Daniel H. Cowles was chosen vice-president. Mr. McBride was formerly vice-president. J. Edward Singleton was also elected a director as successor to Mr. Brown. A resolution on the death of Mr. Brown was adopted in which sympathy was extended to his family with the hope that the knowledge of the esteem in which he was held and the memory of his upright and worthy life may prove of lasting comfort to them.



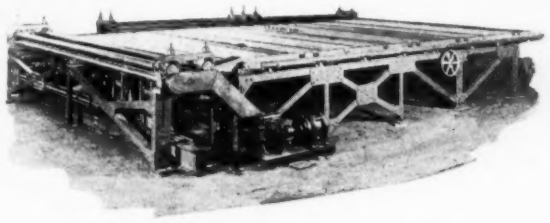
NEW AUTOMATIC TUBE WINDER AND TUBE CUTTER

Built by the Samuel M. Langston Co., Philadelphia, Pa. The recently announced Link-Belt positive variable speed transmission is used in connection with this machine.

## New Wall Board Cutting Machine

B. M. Root Company, manufacturers of boring machines and lumber hoists, of York, Pa., have brought out a new machine for cutting wall board and insulating board materials after they come from the drier. The purpose in the design of this machine is to trim and cut sheet material, as received from the drier, into any desired square or rectangular sizes.

The machine is specially designed for cutting wall board, insulating building board, homogeneous hard-wood board,



NEW ROOT WALL BOARD CUTTING MACHINE

wood or fiber pulp board, veneers, or any other similar sheet materials which can be cut with saws or grinding wheels, and which require trimming and reduction to smaller areas.

All saws are individually motorized and each motorized saw may be quickly and easily moved either vertically or horizontally while the machine is in operation. The design of the machine is so flexible that it may be built to fit into any system of production.

The B. M. Root Company have just issued the first of a series of pamphlets on their Multiple Sawing and Resawing equipment, Shiplap machines and Beveling machines, and will be pleased to forward copies upon application.

## Hoberg Paper Had Good Year

[FROM OUR REGULAR CORRESPONDENT]

APPLETON, Wis., April 13, 1931—Another Wisconsin paper mill which weathered 1930 successfully is the Hoberg Paper and Fibre Company, of Green Bay. Net income for the year totaled $315,393 before federal taxes and interest, comparable to $375,934 for 1929. Sales during 1930 totaled $2,996,000, as compared to $3,106,000 the previous year. Costs were approximately the same, totaling $2,756,000 in 1929 and $2,704,000 in 1930. The company has outstanding $799,900 of first mortgage 7 per cent bonds, and $22,000 of second mortgage bonds. It is believed the earnings will reach 3.85 times the interest on the first mortgage bonds.

## Hawley Now Operating All Machines

[FROM OUR REGULAR CORRESPONDENT]

PORTLAND, Ore., April 11, 1931—The Hawley Pulp and Paper Company, Oregon City, with the exception of mill A, is now operating all departments, starting April 7, and giving employment to many men who have been idle. Machine No. 2 has been down since the first of the year and machines 1, 3 and 4 have been idle for several weeks. The plant will be on a five-day basis and will operate as long as conditions justify.

## Doctors

The lodding self-aligning doctor for calendars, driers, breast rolls, presses, etc., is described in advertising matter now being issued by the Valley Iron Works Company, Appleton, Wis.

## New York Trade Jottings

G. R. Mattson, of the New York offices of the Albemarle Paper Manufacturing Company, of Richmond, Va., visited the leading New England paper merchants last week.

* * *

O. F. Swanson, sales manager of J. Anderson & Co., and the Pulp and Trading Company, with offices at 21 East 40th street, New York, is making a tour of the Middle Western paper mills.

* * *

The Mersey Paper Company's steamer *Markland*, which docked last week at Pier 57, East River, New York, carried what was said to be the largest cargo of news print paper ever shipped here from any part of the continent, consisting of 6,028 rolls. This paper was manufactured in the Mersey Paper Company's mills at Liverpool, Nova Scotia.

* * *

Eldridge Haynes, of the Marketing Counselors Staff of the McGraw-Hill Company, was the guest speaker at the regular weekly luncheon and meeting of the Eastern Division of the Salesmen's Association of the Paper Industry at George's Restaurant, New York, on Tuesday. Mr. Haynes discussed strategy in commodity selling in a comprehensive manner.

* * *

The American Management Association is sponsoring a packaging conference and clinic, under the auspices of the consumer division of the association. In conjunction with the conference an exhibition will be held at the Hotel Pennsylvania, New York, from May 19 to 21, inclusive, at which packages of cardboard, cellophane and paper, theft-proof, water-proof and air-tight, will be displayed. The subject of packaging, in all of its phases, will be taken up at the conference.

* * *

Donald K. Brown, formerly associated with the Strathmore Paper Company for many years, has joined the sales staff of the American Writing Paper Company, Inc., with New York offices at 41 Park Row. Mr. Brown served in the World War for about sixteen months, eleven months of which was spent over-seas with Company H of the 127th Infantry, 32nd Division. Mr. Brown possesses a wide knowledge of the fine paper industry and should prove a valuable addition to the Eagle A organization.

## Atlantic Gummed Paper Corp. Formed

Fred Stocker who has represented the Nashua Gummed and Coated Paper Company in New York City for the past ten years has recently resigned to take up the duties of president and sales manager of the newly organized concern of Atlantic Gummed Paper Corporation.

The Atlantic Gummed Paper Corporation will be located at 35 York street, Brooklyn, N. Y. They will manufacture gummed cambric for corrugators' use, and all grades of gummed cambric for the bookbinders and specialty manufacturers. Their line will also include all grades of gummed paper tapes, both plain and printed, also printed labels.

The officers are Abe Warshaw, treasurer, Nathan Warshaw, secretary, Fred Stocker, president. They are equipping their factory with one of the very latest gumming machines which is being built with special improvements. They will also have a complete battery of printing presses and slitters.

The factory will be fully equipped and operating about June 1.

## Boston Paper Trade Happenings

[FROM OUR REGULAR CORRESPONDENT]

BOSTON, Mass., April 13, 1931—The Arnold-Roberts Company are introducing to their customers Collins Vanity Fair Covers, stocked in warehouse. It is made by the A. M. Collins Manufacturing Company, Philadelphia. A distinctive new line, processed by an original Collins method, Vanity Fair is workable, plastic and tough, equally receptive to water-color and oil inks. It is intended for covers, folders, announcements, booklets, portfolios and menus, and made in pastel colors, gray, buff, peach, blue, green and marigold.

John Carter & Co., Inc., are issuing a price list of printing papers, cardboard and envelopes, including odd lots of standard and advertised lines.

Utility Coated Book is another John Carter leader of excellent printing quality and well adapted for folding and general utility printing, samples of which John Carter & Co., Inc., are sending out.

The Howard Paper Company and the Globe Paper Companies are to remove from 10 High street to Stillings street, so that their offices will be adjacent to their warehouses.

The Boston office of the Deerfield Glassine Company, formerly in Room 401, is now in Room 418 at 176 Federal street.

Donald J. MacMillan, of the Morey Paper Mill Supply Company, is on a trip to the paper mills of the South and expects to visit mills in Cuba and Mexico before his return.

G. R. Mattson, of the New York office of the Albemarle Paper Manufacturing Company, Richmond, Va., has been calling on the trade in connection with Albemarle blottings.

## Oliver H. Sawyer Dead

Oliver H. Sawyer, paper manufacturer's agent, of 97 Warren street, New York, who performed important confidential work for the State Department during the World War, died Thursday, April 8, in Asheville, N. C., at the age of 54. He is survived by a widow, Leila, daughter of the late John E. Gardin, and a brother, Miles Standish Sawyer of Rutland, Vt.

A native of Illinois, Mr. Sawyer spent the early part of his life in New Jersey. His family traced to New England Colonial days, and he was a descendant of Miles Standish. His entire business career was concerned with the paper industry as a representative of manufacturers. In the World War he was first in the Treasury Department Secret Service, later in the Bureau of Special Agents of the State Department. He helped guard the King and Queen of the Belgians and the Prince of Wales on their visits here. His customary services, however, were of a kind that precluded their exact description.

## M. L. Smith Goes With Indian Service

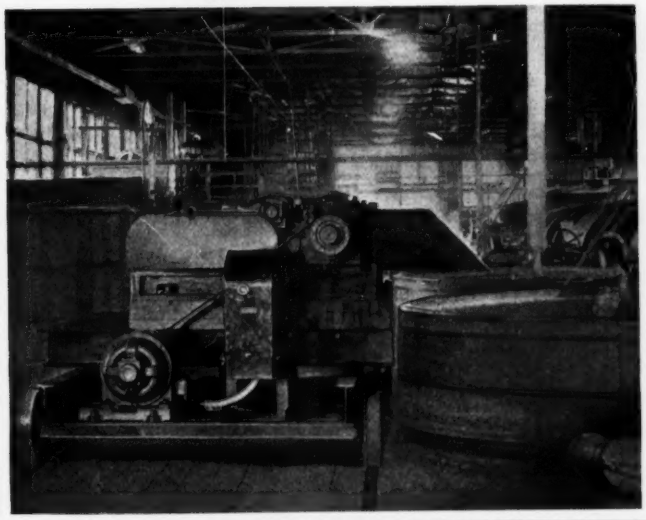
Milton L. Smith, who for the past ten years has been connected with the News Print Service Bureau first in a statistical capacity and later as cost accountant and who has had an excellent record throughout, has accepted a position in the U. S. Indian Service at the Klamath Agency in Oregon.

Mr. Smith has just left with his wife and family to make the trip by automobile to the scene of his new activities which promise to be most interesting. He plans to stop for a few days in Washington to become better acquainted with official duties and also for a few days with the home-folks in Alabama, as the southern route is the only practical one for the trip at this time of year. He plans to be on the new job early in May.

RYTHER AND PRINGLE COMPANY CARTHAGE N.Y.

# PORTABLE SHREDDER

**Ryther shredder mounted on truck arranged to furnish four beaters.**



**The mounting consists of a standard RYTHER shredder assembled on a truck carrying a twenty-five horsepower motor and compensator. The truck wheels are roller bearing and operate on a seven foot gauge track. The unit is arranged to deliver shredded pulp directly into the beater tubs. For small furnishes this apparatus is very economical because no conveying system is used and there is no cleanup loss from stock over-run.**

**Canadian Ingersoll-Rand Co., Ltd.**

10 Phillips Sq., Montreal, P. Q.

EXTENSION MODEL

## Cambridge Surface Pyrometer

is an instrument which applied to the surface of a dryer or calender roll, instantly indicates the exact surface temperature. Its use enables the operator to locate water logged rolls and to maintain every roll at the correct temperature for efficient progressive drying.

The instrument is compact, rugged and easy to read. The extension rod permits temperature checking across the entire roll. Scale ranges are 50-250° and 50-400°F.

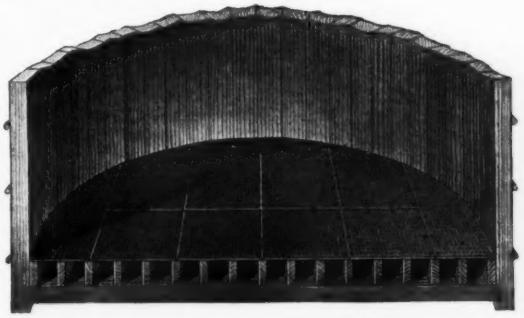
*Send for List No. 194-P.T.*

CAMBRIDGE INSTRUMENT CO., INC.

3512 GRAND CENTRAL TERMINAL, NEW YORK

## Perforated Metal Drainer Bottoms

Made of Chrome Nickel Iron Sheets for use in blow pits, come nearer to solving one of the most troublesome problems in the Sulphite Mills, both from the standpoint of waste and upkeep than any other material introduced to date.



*Typical Installation of Perforated Blow Pit Drainer Bottom*

This Alloy Metal is non-corrosive, and is fastened securely to your present wood joist. The sheets, perforated with 3/32" round holes, ½" centers, give fast drainage, will not clog, saves fibre loss and replaces the old style wood or tile costly drainer blocks. Advise size of tanks and we will submit further details.

NORTMANN-DUFFKE CO.

Milwaukee, Wis.

# IMPORTS OF PAPER AND PAPER STOCK

## NEW YORK, BOSTON, PHILADELPHIA AND OTHER PORTS

## NEW YORK IMPORTS

WEEK ENDING APRIL 11, 1931

### SUMMARY

| | |
|---|---|
| Cigarette paper | 402 cs. |
| Wall paper | 8 bls., 17 cs. |
| Paper hangings | 3 bls. |
| News print | 7455 rolls |
| Printing paper | 22 rolls, 33 cs. |
| Wrapping paper | 22 rolls, 28 cs. |
| Packing paper | 2 cs. |
| Filter paper | 105 bls., 27 cs. |
| Drawing paper | 39 cs. |
| Filter masse | 65 bls. |
| Decalcomania paper | 18 cs. |
| Gold coated paper | 8 cs. |
| Baryta coated paper | 25 cs. |
| Surface coated paper | 27 cs. |
| Basic paper | 8 cs. |
| Metal paper | 6 cs. |
| Colored paper | 15 cs. |
| Aluminum paper | 8 cs. |
| Greaseproof paper | 80 rolls |
| Writing paper | 7 cs. |
| Envelopes | 2 cs. |
| Straw boards | 341 rolls |
| Detail paper | 16 cs. |
| Shelf paper | 2 cs. |
| Miscellaneous paper | 1559 rolls, 96 bls., 62 cs. |

### CIGARETTE PAPER

Standard Products Corp., Paris, Havre, 113 cs.
Brown & Williamson Tobacco Corp., Paris, Havre, 4 cs.
Brown & Williamson Tobacco Corp., Homeric, Southampton, 15 cs.
Champagne Paper Corp., Shodack, Havre, 254 cs.
Max Speigel & Son, G. Washington, Hamburg, 16 cs.

### WALL PAPER

W. H. S. Lloyd & Co., American Trader, London, 3 bls., 1 cs.
M. J. Corbett & Co., Stuttgart, Bremen, 5 cs.
R. F. Downing & Co., Minnewaska, London, 2 bls.
R. F. Downing & Co., Homeric, Southampton, 10 cs.
New York Trust Co., Homeric, Southampton, 1 cs.
F. J. Emmerich, Ascania, London, 3 bls.

### PAPER HANGINGS

A. C. Dodman Jr., Inc., Laurentic, Liverpool 3 bls.

### NEWS PRINT

Jay Madden Corp., Chickasaw, Hango, 723 rolls.
Jay Madden Corp., Stuttgart, Bremen, 219 rolls.
Perkins Goodwin & Co., Stuttgart, Bremen, 122 rolls.
Stora Kopperberg Corp., Drottningholm, Gothenburg, 55 rolls.
Lunham & Reeve, Lagaholm, Hango, 308 rolls.
W. H. Bell, Markland, Liverpool, N. S., 6028 rolls.

### PRINTING PAPER

J. Beckard, Stuttgart, Bremen, 7 cs
P. C. Zuhlke, Struttgart, Bremen, 2 cs.
Oxford University Press, Laurentic, Liverpool, 24 cs.
Keuffel & Esser Co., G. Washington, Hamburg, 2 rolls.

### WARPPING PAPER

A. Johnson Co. Inc., Drottningholm, Gothenburg, 22 rolls.
E. Dietzgen & Co., Sac City, Rotterdam, 28 cs.

### PACKING PAPER

Dobeckman Co., Sac City, Rotterdam, 2 cs.

### FILTER PAPER

H. Reeve Angel & Co., Inc., American Trader, London, 21 cs.
H. Reeve Angel & Co., Inc., Homeric, Southampton, 6 cs., 20 bls.
A. Giese & Son, Homeric, Southampton, 85 bls.

### FILTER MASSE

J. Manheimer, Struttgart, Bremen, 65 bls.

### DRAWING PAPER

Kueffel & Esser Co., G. Washington, Hamburg, 39 cs.

### DECALCOMANIA PAPER

C. W. Sellers, Bremen, Bremen, 12 cs.
L. A. Comsmiller, Bremen, Bremen, 6 cs.

### GOLD COATED PAPER

F. Murray Hill, Stuttgart, Bremen, 8 cs.

### BARYTA COATED PAPER

Globe Shipping Co., Stuttgart, Bremen, 25 cs.

### SURFACE COATED PAPER

P. C. Zuhlke, Stuttgart, Bremen, 20 cs.
H. Fuchs & Son, Sac City, Rotterdam, 7 cs.

### BASI CPAPER

J. H. Schroeder Banking Corp., Stuttgart, Bremen, 5 cs.
Globe Shipping Co., Bremen, Bremen, 3 cs.

### METAL PAPER

K. Pauli Co., Stuttgart, Bremen, 6 cs.

### PHOTO PAPER

J. H. Schroeder Banking Corp., Bremen, Bremen, 1 cs.
J. J. Gavin, Homeric, Southampton, 5 cs.

### COLORED PAPER

Phoenix Shipping Co., Stuttgart, Bremen, 10 cs.
P. C. Kuyper, Stuttgart, Bremen, 1 cs.
S. Gilbert, Stuttgart, Bremen, 3 cs.
S. Gilbert, Bremen, Bremen, 1 cs.

### ALUMINUM PAPER

Keller Dorian Paper Co., Stuttgart, Bremen, 8 cs.

### GREASEPROOF PAPER

——, Sac City, Rotterdam, 80 rolls.

### WRITING PAPER

Guibout Freres, Paris, Havre, 7 cs.

### ENVELOPES

J. Beckard, Stuttgart, Bremen, 2 cs.

### STRAW BOARDS

Walker Goulard Plehn Co., Sac City, Rotterdam, 195 rolls.
R. Wilson Paper Corp., Sac City, Rotterdam, 146 rolls.

### DETAIL PAPER

Globe Shipping Co., Stuttgart, Bremen, 16 cs.

### SHELF PAPER

Kaplan Bros., Stuttgart, Bremen, 2 cs.

### MISCELLANEOUS PAPER

G. A. Vedovie & Co., Roma, Genoa, 6 cs.
Lunham & Reeve, Drottningholm, Gothenburg, 168 rolls, 80 bls.
The Borregaard Co., Inc., Drottningholm, Gothenburg, 1391 rolls.
Walker Goulard Plehn Co., Drottningholm, Gothenburg, 16 bls.
Japan Paper Co., Drottningholm, Gothenburg, 2 cs.
S. Bienfang, Stuttgart, Bremen, 7 cs.
Japan Paper Co., Ascania, London, 1 cs.
Keller Dorian Paper Co., Paris, Havre, 3 cs.
Schmidt & Pritchard, Paris, Havre, 2 cs.
A. Flinn, Paris, Havre, 2 cs.
M. Pressner Co., Paris, Havre, 1 cs.
P. J. Schweitzer, Paris, Havre, 35 cs.
Cheramy, Inc., Paris, Havre, 3 cs.

### RAGS, BAGGINGS, ETC.

J. Cohen Son & Co., Inc., Laurentic, Liverpool, 24 bls. rags.
——, Stuttgart, Bremen, 19 bls. rags.
Royal Manufg. Co., Sac City, Rotterdam, 46 bls. thred waste.
E. J. Keller Co., Inc., Schodack, ——, 52 bls. rags.
Irving Trust Co., Ala Antwerp, 312 bls. bagging.
Castle & Overton, Inc., Ala, Antwerp, 233 bls., bagging.
Katzenstein & Keene, Inc., Ala, Antwerp, 289 bls. rags.
Chase National Bank, Hinnoy, Lisbon, 131 bls. bagging.
Kidder Peabody Accep. Corp., Hinnoy, Barcelona, 45 bls. bagging.
Chemical Bank & Trust Co., Hinnoy, Barcelona, 110 bls. rags.
Marine Midland Trust Co., Hinnoy, Barcelona, 407 bls. rags.
Bank of N. Y. & Trust Co., Hinnoy, Barcelona, 108 bls. rags; 124 bags old pickers.
A. Abela & Co., Ida, Trieste, 80 bls. rags.
Banco Com'l Italiane Trust Co., Ida, Venice, 153 bls. bagging.

### OLD ROPE

Chemical Bank & Trust Co., G. Washington, Hamburg, 33 coils.
Brown Bros. Harriman Co., Bristol City, Bristol, 58 coils.
——, Savoia, Genoa, 114 coils.
——, Ida, Trieste, 55 coils.

### CHINA CLAY

L. A. Salomon & Bros., Laurentic, Liverpool, 140 bags.

### CASEIN

A. Hurst & Co., G. Washington, Hamburg, 54 bags.

### WOOD PULP

Lagerloef Trading Co., Chickasaw, Hango, 2979 bls. sulphate, 496 tons; 1462 bls. sulphite, 265 tons.
Johaneson Wales & Sparre, Inc., Drottningholm, Gothenburg, 5 bls. sulphite.
E. M. Sergeant & Co., Drottningholm, Gothenburg, 449 bls. kraft soda pulp.
E. M. Sergeant & Co., Larviksfjord, Oslo, 318 bls. wood pulp.
M. Gottesman & Co., Inc., Lagaholm, Stockholm, 900 bls. sulphite.
M. Gottesman & Co., Inc., Ida, Sebenico, 3960 bls. wood pulp.
E. J. Keller Co., Inc., G. Washington, ——, 360 bls. wood pulp, 56 tons.

### WOOD FLOUR

——, Sac City, Rotterdam, 122 bls., 5800 kilos.

### WOOD PULP BOARDS

Johaneson, Wales & Sparre, Inc., Lagaholm, Hango, 15 bls.

## PHILADELPHIA IMPORTS

WEEK ENDING APRIL 11, 1931

Johaneson Wales & Sparre, Inc., Lagaholm, Stockholm, 385 bls., wood pulp.
Lagerloef Trading Co., Lagaholm, Stockholm, 1524 bls. sulphate; 6377 bls. sulphite.
Parsons & Whittemore, Inc., Lagaholm, Stockholm, 307 bls. wood pulp.
J. W. Hampton Jr. & Co., Lagaholm, Stockholm, 52 rolls news print.
Hoffman Lion Mills, Atago Maru, Osaka, 80 bls. rags.
——, Ala, Antwerp, 71 bls. rags.
Katzenstein & Keene, Inc., Ala, Antwerp, 187 bls. rags.
J. E. Bernard & Co., Ala, Antwerp, 13 cs. printing paper.
Baring Bros. & Co., Bristol City, Bristol, 117 bls. rags.
J. A. Steer & Co., Bristol City, Bristol, 120 coils old rope.
E. J. Keller Co., Inc., Hannover, ——, 707 bls. wood pulp; 93 bls. rags.

*(Continued on page 74)*

Cotton and Paper Rolls
Super Calenders
Friction Calenders
Embossing Calenders
Hydraulic Presses and Pumps

*Successors to the Granger Foundry & Machine Co.*

**The Textile-Finishing Machinery Company**
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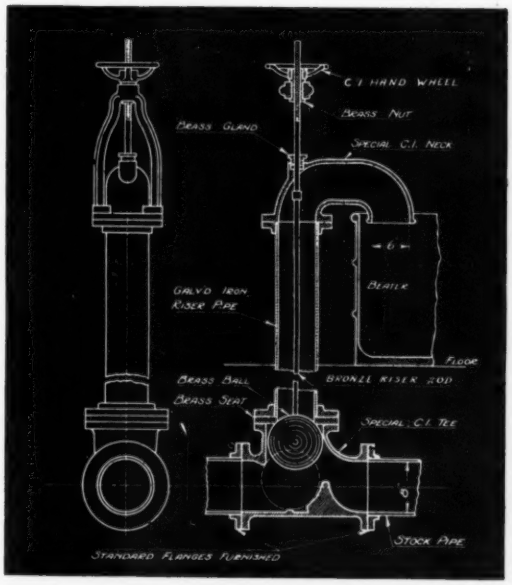


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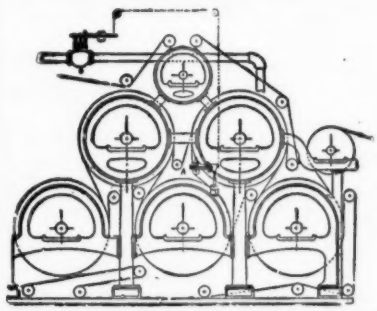

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**W. F. PICKLES** **Buckland, Conn.**

# Imports of Paper and Paper Stock

*(Continued from page 72)*

## BOSTON IMPORTS

WEEK ENDING APRIL 11, 1931

Meredith Linen Mills, Ala, Antwerp, 99 bls. flax waste.

F. J. Fawcett, Ala, Antwerp, 74 bls. flax waste.

Leigh Textile Co., Ala, Antwerp, 37 bls thread waste.

Spaulding Fibre Co., Ala, Antwerp, 631 bls. flax waste.

American Express Co., Ala, Antwerp, 108 rolls paper.

Brown Bros. Harriman Co., Ala, Antwerp, 78 coils old rope.

M. Gottesman & Co., Inc., Ida, Sebenico, 3360 bls. wood pulp.

## NORFOLK IMPORTS

WEEK ENDING APRIL 11, 1931

Parsons & Whittemore, Inc., Chickasaw, Stockholm, 50 rolls, 43 bls., news print.

Lagerloef Trading Co., Chickasaw, Hango, 478 rolls wood pulp boards, 153 tons; 8042 bls. sulphite, 1367 tons; 3557 bls. sulphate, 594 tons.

——, Scnodack, Havre, 161 bls. bagging.

## BALTIMORE IMPORTS

WEEK ENDING APRIL 11, 1931

Lagerloef Trading Co., Chickasaw, Hango, 575 bls. wood pulp, 103 tons.

Price & Pierce, Ltd., Chickasaw, Stockholm, 3160 bls. sulphite, 400 tons.

Stora Kopperberg Corp., Chickasaw, Stockholm, 500 bls. sulphate, 101 tons.

Parsons & Whittemore, Inc., Lagaholm, Stockholm, 660 rolls news print.

——, Lagaholm, Stockholm, 750 bls. wood pulp.

Lagerloef Trading Co., Lagaholm, Hango, 310 bls. sulphite; 3418 bls. wood pulp.

Parsons & Whittemore, Inc., Lagaholm, Hango, 900 bls. wood pulp.

Lagerloef Trading Co., Lagaholm, Hango, 140 rolls wood pulp boards.

Antictam Paper Co., Lagaholm, Hango, 29 bls. news print.

Bulkley Dunton & Co., Lagaholm, ——, 2500 bls. wood pulp.

S. Shapira & Son, Schodack, Dunkirk, 82 bls. rags.

## Paper Leads at Hudson Falls

[FROM OUR REGULAR CORRESPONDENT]

HUDSON FALLS, N. Y., April 14, 1931—A booklet compiled by Albert W. Spencer, consulting engineer of the Chamber of Commerce, shows that the manufacture of paper, paper bags, wall paper and paper mill machinery are the most important industries at this place. The article also states that there are eleven manufacturing establishments in the village turning out a wide range of products. Among the other products manufactured are insulating paper, building paper, paper boxes, lumber and wood products. The percentage of the annual value of products shows that the paper and allied industries lead with about 80 per cent. The total value of products turned out during the past year was estimated at $8,000,000 and these industries furnish employment to about 1,350 persons.

## Connecticut Valley Cost Men to Meet

A meeting of the Connecticut Valley Cost Division of the American Paper and Pulp Association will be held at the Hotel Stonehaven, Springfield, Mass., on Thursday, April 23rd. Dinner will be served at 6:30 P.M. sharp, and following the dinner, an address will be given by Henry R. Boston, on the subject "Standard Costs in Paper Mills."

Mr. Boston is now located in New York City, but for some years was accountant at the Stevens & Thompson Paper Mills, North Hoosick, N. Y. He was active in the affairs of the Cost Association of the Paper Industry, and is well-known to pulp and paper accountants, so that a good attendance is expected at this meeting.

Reservations should be forwarded to Paul Wilks, Strathmore Paper Company, West Springfield, Mass.

## William Siemon Made Board Chairman

Cincinnati, Ohio, April 14, 1931.—William Siemon has recently made arrangements to turn over the more active management and affairs of the La Boiteaux Company to the younger men of the organization just as Roger K. Rogan did some years previous.

Mr. Siemon takes Mr. Rogan's place as chairman of the board of directors; C. H. Upson assumes the presidency and J. A. Barbara and Elliott Wilson have been elected vice presidents.

Mr. Siemon still has a substantial preferred stock interest in the La Boiteaux Company and will continue to be actively engaged, but will not pay as much attention to the many details as he has for the past 26 years.

## History of Paper Making

The Zellerbach Paper Company, of San Francisco, Cal., has just published an illustrated booklet entitled "The History and Description of Paper Making." This attractive publication describes in a concise manner the history and general principles of paper making, and contains sections on "Pulp and Rags and China Clay," "A Modern Story of Paper Making," "Processes In Paper Making," "Packing and Shipping Paper," "Some Interesting Facts About the Paper Industry" and "Paper Builds a Great Business," which is a short story of Zellerbach Paper Company's origin and growth. In discussing the history of paper manufacturing processes, the author presents much interesting information. Incidentally, he points out that the word "Parchment" comes from the fact that some kind of a finishing process on papyrus for paper use was invented in a little town called Pergamus, and from this name "Pergamus" comes the word "Parchment." This information is particularly interesting at the present time, in view of the claim of the Federal Trade Commission that the description "Parchment" should only be applied to the substance made of the skin of a lamb, sheep, kid, goat, calf, or other animal.

## St. Helens Pulp & Paper Co. Busy

PORTLAND, Ore., April 11, 1931—St. Helens Pulp and Paper Company, St. Helens, is now manufacturing 80 tons of kraft a day and expects to increase output to 100 tons as soon as the installation of the $500,000 paper machine is completed, on which tissues will be made.

The product of the St. Helens' mill gets much favorable support from business interests in Portland, many firms using this kraft paper for stationery as a unique idea as well as patronizing a local market. Max Oberdorfer is president and general manager.

## E. H. Robbins Goes With Collins Mfg. Co.

PITTSFIELD, Mass., April 14, 1931—Edward H. Robbins of the sales department of Eaton Crane & Pike for 18 years has resigned to become sales manager for the Collins Manufacturing Company of North Wilbraham with offices in Holyoke. He will take up his new duties May 1, but keep his residence in Pittsfield for a time. He is a native of Lee, graduate of Princeton University and in Pittsfield a member of the Pittsfield Country Club and for seven years Boy Scout Commissioner.

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"HAFSLUND BEAR"
Bleached Sulphite

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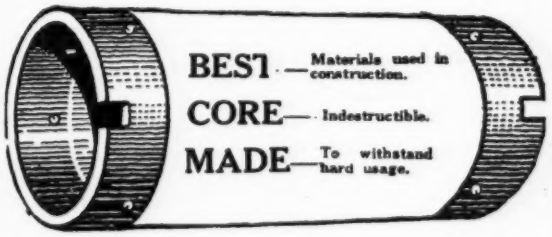


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WOOD PULP
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**Bleached Spruce Sulphite and Soda Kraft Pulp**

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503 Market St., San Francisco, Cal.
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## New York Market Review

Office of the PAPER TRADE JOURNAL.
Wednesday, April 15, 1931.

Trading in the local paper market was moderately active during the past week. Demand for the various standard grades was mainly seasonal. The movement of supplies into consumption was fairly satisfactory. Sales forces of the leading paper organizations continue optimistic. Prices are generally holding to previously quoted levels.

The outlook for the news print market is uncertain, although efforts are still being made by leading manufacturers to stabilize conditions. Production is being maintained at approximately 59 per cent of rated capacity in the United States and Canada. While the official schedule of quotations remains unchanged, reports of shading are frequent.

Demand for the various grades of paper board is fairly persistent. Offerings of box board are about sufficient to take care of prevailing requirements. The fine paper market continues steady. Tissues are moving in fair volume. Some improvement was noticed in the coarse paper market. The kraft wrapping paper situation is more encouraging than of late.

### Mechanical Pulp

Conditions in the ground wood market are satisfactory, considering the general business depression. While spot demand for both domestic and imported mechanical pulp is somewhat irregular, shipments against contract are going forward to the paper mills in good volume. Quotations are generally holding to schedule, without difficulty.

### Chemical Pulp

The position of the chemical pulp market is practically unchanged. Inquiries are fairly numerous, however, and some business has been booked for future delivery. The contract movement is fair. Imported bleached sulphite is still quoted at from $2.60 to $4.25, on dock, Atlantic ports. Domestic bleached sulphite is selling at from $2.40 to $4.75, at pulp mills.

### Old Rope and Bagging

Business in the old rope market was rather quiet. Little interest is being shown by the paper mills at present in either foreign or domestic old manila rope. Small mixed rope is in moderate request. The bagging market is spotty. Although gunny is firm, scrap bagging is weak. Roofing bagging is in fair demand. Prices are generally unchanged.

### Rags

Paper mill interest in the domestic rag market is not much in evidence. Cotton rags are only in moderate request. Roofing rags are seasonally active. Mixed rags are going forward in light volume. No radical changes were reported in the imported rag market. Some mill interest was shown in dark cottons and linsey garments. Prices remain unaltered, in most instances.

### Waste Paper

The paper stock market was somewhat irregular. The better grades were fairly steady. White envelope cuttings are now offered at from $2.70 to $2.85. Solid flat book stock is quoted at from 75 cents to 85 cents. Board mill interest in the lower grades of paper stock is fairly satisfactory. Old kraft machine compressed bales are more active. Strictly folded news is dull.

### Twine

Most of the business transacted in the local twine market was routine. Demand for the various grades is seasonal. There are a fair number of inquiries around for future needs. Supplies are moving in moderate volume. Pricse are holding to formerly quoted levels, in most instances, although there are reports of concessions on extra large orders.

## D. L. Bellinger Dead

GLENS FALLS, N. Y., April 13, 1931.—D. L. Bellinger, of this city, died April 3 at the Hoquiam General Hospital, Hoquiam, Wash., of peritonitis following an operation on March 27. He was born at Nunda, N. Y., February 12, 1877 and is survived by his wife, one son and one daughter, all of Glens Falls, N. Y. He attended Cornell University, graduating in 1905, and in 1907 became connected with the pulp and paper industry as engineer for Finch, Pruyn & Company, remaining in this capacity for about ten years when he became manager of the Carthage Machine Works, Carthage, N. Y., and later was manager of the D. J. Murray Manufacturing Company, Wausau, Wis.

In 1928, Mr. Bellinger returned to Glens Falls as manager of the Glens Falls Machine Works and shortly afterwards became associated with the Trimbey Machine Works, which connection he held at the time of his death. He had been visiting the mills of the Pacific Coast for the past three months and was stricken with appendicitis while at Hoquiam.

"Dan" Bellinger, as he was familiarly called, was well known in the industry and has a host of friends who will unite in sympathy with the family in their great and sudden bereavement.

## Century Paper Co. Re-organizes

[FROM OUR REGULAR CORRESPONDENT]

INDIANAPOLIS, Ind., April 13, 1931—Articles of reorganization have been filed with the secretary of state by the Century Paper Company of this city under the 1929 incorporation act. The company does a general jobbing business and has been in operation here for some years. It has 6,000 shares of capital stock having no declared par value. Robert W. Fleischer is president and H. A. Rowley is secretary.

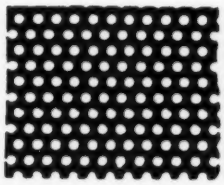
## Bolivia Makes News Print Free

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., April 14, 1931—Word has been received by the Department of Commerce that the Bolivian Congress has passed a law placing news print paper on the duty free list. It was formerly dutiable at 18.00 bolivianos per 100 gross kilos plus 20 per cent of the duty.

## Perforated Metal Screens

### For Pulp and Paper Mills



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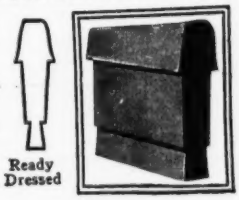


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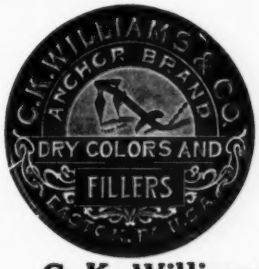


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# Miscellaneous Markets

Office of the PAPER TRADE JOURNAL.
Wednesday, April 15, 1931.

BLANC FIXE.—The blanc fixe market is in a sound position. Contract shipments are moving in good volume. Prices remain unchanged. The pulp is quoted at from $42.50 to $45.00 per ton, while the powder is selling at from 3¾ cents to 4½ cents per pound, in barrels, at works.

BLEACHING POWDER.—Conditions in the bleaching powder market are fairly satisfactory. The contract movement is well up to average. Prices are holding to previously quoted levels. Bleaching powder is quoted at from $2.00 to $2.35 per 100 pounds, in drums, at works.

CASEIN.—The casein market was rather quiet. Domestic standard ground is still quoted at 8 cents and finely ground at 9 cents per pound. Argentine standard ground is selling at 9½ cents and finely ground at 10 cents per pound, all in bags, car lot quantities.

CAUSTIC SODA.—Trading in the caustic soda market was moderately active. Prices are generally holding to schedule. Solid caustic soda is quoted at from $2.50 to $2.55, while the flake and the ground are selling at from $2.90 to $2.95 per 100 pounds, in large drums, at works.

CHINA CLAY.—The position of the china clay market is practically unchanged. The contract movement was normal. Prices are steady. Imported china clay is quoted at from $13 to $21 per ton, while domestic paper making clay is selling at from $7 to $11 per ton, at mine.

CHLORINE.—Steadiness prevails in the chlorine market. Supplies are moving to the paper mills at a fairly satisfactory pace. Prices are holding to schedule. Chlorine is quoted at $2.50 per 100 pounds, in tanks, or multi-unit cars, in ton lots, or over, at works.

ROSIN.—The rosin market is displaying a steady trend. The grades of gum rosin used in the paper mills are still quoted at from $5.90 to $6.30 per 280 pounds, in barrels, at yards. Wood rosin is selling at $4.40 per 280 pounds, in car lots, at southern shipping points.

SALT CAKE—Little change was reported in the salt cake market. Offerings are adequate for current requirements. Salt cake is quoted at from $16 to $17; German salt cake at from $15.50 to $16; and chrome salt cake at from $14 to $15 per ton, in bulk, at works.

SODA ASH.—The soda ash market was only moderately active. Shipments against contract, however, are fairly heavy. Contract quotations on soda ash, in car lots, at works, per 100 pounds, are as follows: in bulk, $1,00; in bags, $1.15; and in barrels, $1.38.

STARCH.—Paper mill interest in the starch market was rather irregular. The contract movement was mainly seasonal. Prices are holding to previously quoted levels. Special paper making starch is quoted at $2.67, in bags; and at $2.94 per 100 pounds, in barrels, at works.

SULPHATE OF ALUMINA.—The sulphate of alumina market is exhibiting a strong undertone. Contract shipments are moving in good volume. Commercial grades are quoted at from $1.25 to $1.40; while iron free is selling at from $1.90 to $2.05 per 100 pounds, in barrels, at works.

SULPHUR.—Seasonal conditions prevail in the sulphur market. Sulphur is still quoted at $18 per long ton, on orders of 1,000 tons, or over, on yearly contracts; and at $20 per ton for any smaller quantity over that period. On spot and near by car loads, the quotation is $21 per ton.

TALC.—Most of the business transacted in the talc market was along routine lines. Prices are holding to former levels. Domestic talc is quoted at from $16 to $18 per ton, in bulk; while imported talc is selling at from $18 to $22 per ton, in bags, ship side.

# Market Quotations

## Paper

(F. o. b. Mill)

| | | | |
|---|---|---|---|
| Ledgers | 11.00 | @ | 38.00 |
| Bonds | 6.75 | @ | 53.25 |
| **Writings—** | | | |
| Extra Superfine | 14.00 | @ | 32.00 |
| Superfine | 14.00 | @ | 32.00 |
| Tub sized | 10.00 | @ | 15.00 |
| Engine sized | 6.75 | @ | 11.00 |
| **Book, Cased—** | | | |
| S. & S. C. | 5.50 | @ | — |
| M. F. | 5.25 | @ | — |
| Coated and Enamel | 7.00 | @ | 10.50 |
| Lithograph | 7.50 | @ | 12.00 |
| **Tissues—Per Ream—** | | | |
| White No. 1 | .65 | @ | .67½ |
| Anti-Tarnish M G only | .65 | @ | .70 |
| Colored | .70 | @ | .90 |
| White No. 2 | .55 | @ | .57½ |
| Kraft | .65 | @ | .70 |
| Manila | .55 | @ | .57½ |
| **Manila—** | | | |
| No. 1 Jute | 9.00 | @ | 9.25 |
| No. 2 Jute | 7.75 | @ | 8.50 |
| No. 1 Wood | 4.00 | @ | 5.25 |
| No. 2 Wood | 3.50 | @ | 4.00 |
| Butchers | 3.37½ | @ | — |
| **Fibre Papers—** | | | |
| No. 1 Fibre | 4.25 | @ | 5.50 |
| No. 2 Fibre | 4.00 | @ | 4.75 |
| Common Bogus | 1.50 | @ | 3.00 |
| Screenings | 2.00 | @ | 3.00 |
| Card Middles | 4.00 | @ | 5.00 |
| **Glassine—** | | | |
| Bleached, basis 25 lbs., No. 1 | .09¾ | @ | — |
| No. 2 | .11¼ | @ | — |
| Bleached, basis 20 lbs. | .11¾ | @ | — |
| (Delivered New York) | | | |
| **News, per ton—** | | | |
| Rolls, contract | 62.00 | @ | — |
| Rolls, spot | 62.00 | @ | — |
| Sheets | 67.00 | @ | — |
| Side Runs | 47.00 | @ | 52.00 |
| **Kraft—** | | | |
| No. 1 Domestic | 4.25 | @ | 5.36 |
| No. 2 Domestic | 3.50 | @ | 4.00 |
| Southern | 3.50 | @ | 4.00 |
| Imported | 6.00 | @ | 7.00 |
| **Boards—per ton—** | | | |
| News | 30.00 | @ | 32.00 |
| Straw | 40.00 | @ | 45.00 |
| Chip | 30.00 | @ | 32.00 |
| Binders' Boards | 65.00 | @ | 70.00 |
| Standard 85 Test Liner | 35.00 | @ | 40.00 |
| Sgl. Mla. Ll. Chip. | 42.50 | @ | — |
| (F. o. b. Mill) | | | |
| Wood Pulp Boards | 70.00 | @ | 80.00 |

## Mechanical Pulp

(On Dock)

| | | | |
|---|---|---|---|
| **No. 1 Imported—** | | | |
| Moist | 28.00 | @ | 32.00 |
| Dry | 30.00 | @ | 34.00 |
| (F. o. b. Mill) | | | |
| No. 1 Domestic | 28.00 | @ | 34.00 |

## Chemical Pulp

(On Dock, Atlantic Ports)

| | | | |
|---|---|---|---|
| **Sulphite (Imported)—** | | | |
| Bleached | 2.60 | @ | 4.25 |
| Easy Bleaching | 2.25 | @ | 2.40 |
| No. 1 strong unbleached | 2.00 | @ | 2.35 |
| Mitscherlich unbleached | 2.10 | @ | 2.70 |
| No. 2 strong unbleached | 1.90 | @ | 2.00 |
| No. 1 Kraft | 1.40 | @ | 1.75 |
| No. 2 Kraft | 1.35 | @ | 1.55 |
| **Sulphate—** | | | |
| Bleached | 2.75 | @ | 3.25 |
| (F. o. b. Pulp Mill) | | | |
| **Sulphite (Domestic)—** | | | |
| Bleached | 2.40 | @ | 4.75 |
| Easy Bleachings | 2.55 | @ | 2.75 |
| News | 1.80 | @ | 2.50 |
| Mitscherlich | 2.50 | @ | 3.25 |
| Kraft (Domestic) | 1.60 | @ | 2.75 |
| Delivered Paper Mills) | | | |
| Soda Bleached | 3.00 | @ | — |

## Domestic Rags

New Rags

(Prices to Mill f. o. b. N. Y.)

| | | | |
|---|---|---|---|
| **Shirt Cuttings—** | | | |
| New White, No. 1 | 7.50 | @ | 8.00 |
| New White, No. 2 | 6.50 | @ | 7.00 |
| Silesias No. 1 | 5.75 | @ | 6.00 |
| New Unbleached | 8.00 | @ | 8.50 |
| New Blue Prints | 4.50 | @ | 5.00 |
| New Soft Blacks | 4.00 | @ | 4.50 |
| Blue Overall | 5.50 | @ | 6.00 |
| Washables | 3.75 | @ | 4.00 |
| Fancy | 4.00 | @ | 4.50 |
| Mixed Khaki Cuttings | 4.25 | @ | 5.25 |
| Pink Corset Cuttings | 6.50 | @ | 7.00 |
| O. D. Khaki Cuttings | 5.15 | @ | 5.75 |
| Men's Corduroy | 3.00 | @ | 3.50 |
| New Mixed Blacks | 3.00 | @ | 3.25 |
| **Old Rags** | | | |
| **White, No. 1—** | | | |
| Repacked | 5.25 | @ | 5.75 |
| Miscellaneous | 4.25 | @ | 4.75 |
| **White, No. 2—** | | | |
| Repacked | 3.00 | @ | 3.50 |
| Miscellaneous | 2.30 | @ | 2.50 |
| St. Soiled, White | 1.50 | @ | 1.75 |
| **Thirds and Blues—** | | | |
| Repacked | 2.25 | @ | 2.50 |
| Miscellaneous | 1.65 | @ | 1.85 |
| Black Stockings | 3.25 | @ | 3.75 |
| **Roofing Rags—** | | | |
| Cloth Strippings | 1.25 | @ | 1.30 |
| No. 1 | 1.25 | @ | 1.30 |
| No. 2 | .90 | @ | 1.00 |
| No. 3 | .70 | @ | .80 |
| No. 4 | .65 | @ | .70 |
| No. 5A | .50 | @ | .60 |

## Foreign Rags

New Rags

| | | | |
|---|---|---|---|
| New Dark Cuttings | 2.00 | @ | 2.15 |
| New Mixed Cuttings | 2.10 | @ | 2.40 |
| New Light Silesias | 5.50 | @ | 5.75 |
| Light Flannelettes | 6.25 | @ | 6.75 |
| Unbleached Cuttings | 7.50 | @ | 8.00 |
| New White Cuttings | 7.25 | @ | 7.75 |
| New Light Oxfords | 5.50 | @ | 5.75 |
| New Light Prints | 3.75 | @ | 4.25 |

Old Rags

| | | | |
|---|---|---|---|
| No. 1 White Linens | 7.00 | @ | 7.50 |
| No. 2 White Linens | 5.50 | @ | 6.00 |
| No. 3 White Linens | 4.00 | @ | 4.50 |
| No. 4 White Linens | 2.50 | @ | 3.00 |
| No. 1 White Cotton | 5.00 | @ | 5.50 |
| No. 2 White Cotton | 4.00 | @ | 4.50 |
| No. 3 White Cotton | 2.75 | @ | 3.75 |
| No. 4 White Cotton | 1.60 | @ | 1.75 |
| Extra Light Prints | 2.50 | @ | 2.75 |
| Ord. Light Prints | 2.10 | @ | 2.25 |
| Med. Light Prints | 1.65 | @ | 1.75 |
| Dutch Blue Cottons | 1.90 | @ | 2.10 |
| French Blue Linens | 2.65 | @ | 2.75 |
| German Blue Linens | 2.25 | @ | 2.40 |
| German Blue Cottons | 1.75 | @ | 1.85 |
| Checks and Blues | 1.60 | @ | 1.75 |
| Lindsay Garments | 1.10 | @ | 1.20 |
| Dark Cottons | .80 | @ | .90 |
| Old Shopperies | .75 | @ | .80 |
| New Shopperies | .75 | @ | .80 |
| French Blues | 1.80 | @ | 1.90 |

## Old Rope and Bagging

(Prices to Mill f. o. b. N. Y.)

| | | | |
|---|---|---|---|
| Gunny No. 1— | | | |
| Foreign | 1.65 | @ | 1.80 |
| Domestic | 1.65 | @ | 1.80 |
| Wool Tares, light | 1.30 | @ | 1.40 |
| Wool Tares, heavy | 1.30 | @ | 1.40 |
| Bright Bagging | 1.30 | @ | 1.35 |
| Small Mixed Rope | .90 | @ | 1.00 |
| Manila Rope— | | | |
| Foreign | 2.05 | @ | 2.25 |
| Domestic | 2.20 | @ | 2.25 |
| New Burlap Cut | 2.10 | @ | 2.25 |
| Hessian Jute Threads— | | | |
| Foreign | 2.60 | @ | 2.75 |
| Domestic | 2.80 | @ | 3.00 |

## Old Waste Papers

(F. o. b. New York)

| | | | |
|---|---|---|---|
| **Shavings—** | | | |
| Hard, white, No. 1 | 2.75 | @ | 2.85 |
| Hard White, No. 2 | 2.20 | @ | 2.30 |
| Soft, white, No. 1 | 2.30 | @ | 2.40 |
| White envelope cuttings | 2.70 | @ | 2.85 |
| **Flat Stock—** | | | |
| Stitchless | .85 | @ | .95 |
| Overissue Mag. | .85 | @ | .95 |
| Solid Flat Book | .75 | @ | .85 |
| Crumpled No. 1 | .60 | @ | .65 |
| Solid Book Ledger | 1.75 | @ | 1.85 |
| Ledger Stock | .80 | @ | .85 |
| New B. B. Chips | .20 | @ | .30 |
| **Manilas—** | | | |
| New Env. Cut | 2.00 | @ | 2.20 |
| New Cuttings | 1.50 | @ | 1.65 |
| Extra No. 1 old | 1.20 | @ | 1.30 |
| Print | .50 | @ | .60 |
| Bogus Wrapper | .50 | @ | .60 |
| Container | .25 | @ | .30 |
| **Old Kraft Machine—** | | | |
| Compressed bales | 1.10 | @ | 1.20 |
| **News—** | | | |
| No. 1 White News | 1.60 | @ | 1.70 |
| Strictly Overissue | .40 | @ | .45 |
| Strictly Folded | .30 | @ | .35 |
| No. 1 Mixed Paper | .15 | @ | .25 |
| Common Paper | Nominal | | |

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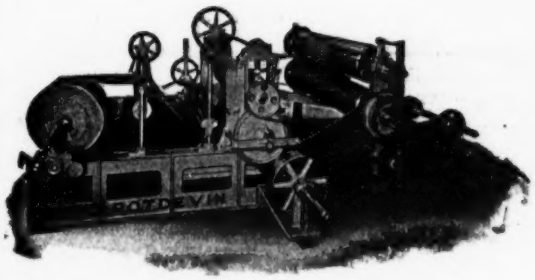
## PAPER WAXING MACHINERY

**Three Widths—52" - 64" - 80"**

**LIGHT OR HEAVY COATING**
**WET OR DRY WAX**
**ONE OR BOTH SIDES**

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**Phones: Windsor 1700, 1701, 1702**

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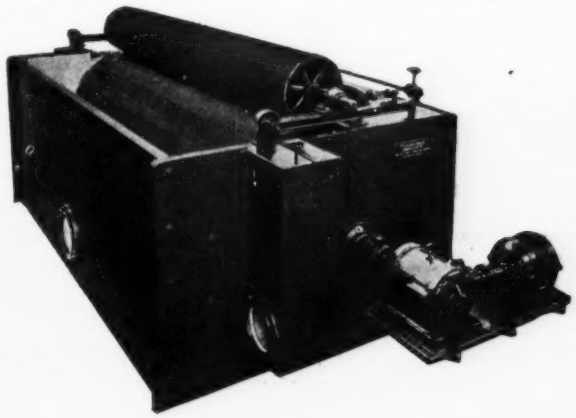

**MODERN DESIGN**
**SUBSTANTIAL CONSTRUCTION**
**PERFECT CONTROL**

***BUILT IN SIZES 36" x 72" to 48" x 132"***

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# H-T BRAND

COATING AND FILLING

The Clay of Uniformity

## AMERICAN MADE FOR AMERICAN TRADE

Edgar Clays are the result of more than fifty years experience in washing clay—used by leading paper mills.

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## EDGAR BROS. CO.

50 CHURCH ST., NEW YORK

### Twines
(F. o. b. Mill)

| | | | |
|---|---|---|---|
| **Cotton—** | | | |
| B. C., 18 basis | .32 | @ | .34 |
| No. 1 | .22 | @ | .24 |
| No. 2 | .21 | @ | .22 |
| No. 3 | .19 | @ | .20 |
| A. Italian, 18 basis | .38 | @ | .39 |
| **Finished Jute—** | | | |
| Dark 18 basis | .20½ | @ | .21 |
| Light 18 basis | .22½ | @ | — |
| **Jute Wrapping, 3-6 Ply—** | | | |
| No. 1 | .14¼ | @ | — |
| No. 2 | .13¾ | @ | — |
| **Tube Rope—** | | | |
| 4-ply and larger | .10¼ | @ | — |
| **Fine Tube Rope—** | | | |
| 4-ply | .12¾ | @ | — |
| 3-ply | .13¾ | @ | — |
| 2-ply | .14¾ | @ | — |
| **Paper Makers Twine** | | | |
| Balls | .08¾ | @ | — |
| **Box Twine, 2-3 ply** | .09 | @ | .10 |
| **Jute Rope** | .11 | @ | .12 |
| **Amer. Hemp, 6** | .29 | @ | .31 |
| **Java Sisal** | | | |
| No. 1 Basis | .12 | @ | — |
| No. 2 Basis | .11¼ | @ | — |
| **New Zealand Sisal** | .11½ | @ | — |
| **Sisal Lath Yarn—** | | | |
| No. 1 | .14 | @ | .16 |
| No. 2 | .12 | @ | .14 |
| **Manila Twine** | .22½ | @ | .24½ |

## CHICAGO

### Paper
(F. o. b. Mill)

| | | | |
|---|---|---|---|
| **Rag Bond** | .30 | @ | .53¾ |
| **Water Marked Sulphite Bond** | .09 | @ | .12 |
| **Sulphite Bond** | .06¾ | @ | .11 |
| **Superfine Writing** | .18 | @ | .24 |
| **No. 1 Fine Writing** | .14 | @ | .18 |
| **No. 2 Fine Writing** | .12 | @ | .14 |
| **No. 3 Fine Writing** | .08½ | @ | .12 |
| **No. 1 M. F. Book** | .06½ | @ | .07¼ |
| **No. 2 M. F. Book** | .05¼ | @ | .06¼ |
| **No. 1 S.&S.C. Book** | .06¼ | @ | .07¾ |
| **No. 2 S.&S.C. Book** | 05¾ | @ | .06½ |
| **Coated Book** | .07½ | @ | .12 |
| **Coated Label** | .07½ | @ | .10 |
| **No. 1 Manila** | .04¼ | @ | .05¾ |
| **No. 1 Fibre** | .04¾ | @ | .05¼ |
| **No. 2 Manila** | .04¼ | @ | .04¾ |
| **Butcher's Manila** | .04 | @ | .04½ |
| **No. 1 Kraft** | 5.00 | @ | 5.50 |
| **Southern Kraft** | 3.75 | @ | 4.00 |
| **No. 2 Kraft** | 3.75 | @ | 4.00 |
| **Wood Tag Boards** | .04¾ | @ | .06¼ |
| **Sulphite Screenings** | .03 | @ | .03¼ |
| **Manila Tissue** | .07 | @ | .07¾ |
| **White Tissue** | .07¾ | @ | .07½ |
| (Delivered Central Territory) | | | |
| **News, per ton—** | | | |
| Rolls, contract | 62.00 | @ | — |
| Sheets | 67.00 | @ | — |
| **Boards, per ton—** | | | |
| Plain Chip | 30.00 | @ | 35.00 |
| **Solid News** | 32.50 | @ | 37.50 |
| **Manila Lined Chip** | 40.00 | @ | 45.00 |
| **Container Lined—** | | | |
| 85 Test | 50.00 | @ | 55.00 |
| 100 Test | 55.00 | @ | 60.00 |

### Old Papers
(F. o. b. Chicago)

| | | | |
|---|---|---|---|
| **Shavings—** | | | |
| No. 1 Hard White | 2.35 | @ | 2.40 |
| White Env. Cuttings | — | @ | — |
| **No. 1 Soft Shavings** | 2.10 | @ | 2.15 |
| **Ledger & Writings** | .70 | @ | .75 |
| **Solid Books** | .75 | @ | .80 |
| **Blanks** | 1.60 | @ | 1.65 |
| **Krafts** | 1.25 | @ | 1.35 |
| **New Kraft Cuts** | 1.35 | @ | 1.45 |
| **Manila Env. Cuts** | 1.50 | @ | 1.55 |
| **Ex. No. 1 Manila** | 1.25 | @ | 1.30 |
| **Print Manila** | .40 | @ | .45 |
| **Overissue News** | .40 | @ | .45 |
| **Old Newspapers—** | | | |
| No. 1 | .35 | @ | .40 |
| No. 2 | .30 | @ | .35 |
| **Mixed Papers—** | | | |
| No. 1 | .28 | @ | .30 |
| No. 2 | .20 | @ | .25 |
| **Roofing Stocks—** | | | |
| No. 1 | 30.00 | @ | — |
| No. 2 | 28.00 | @ | — |

## PHILADELPHIA

### Paper
(F. o. b. Mill)

| | | | |
|---|---|---|---|
| **Bonds** | .05 | @ | .40 |
| **Ledgers** | .07 | @ | .40 |
| **Writings—** | | | |
| Superfine | .12 | @ | .18 |
| Extra fine | .16 | @ | .22 |
| Fine | .15 | @ | .26 |
| Fine, No. 2 | .13½ | @ | .25 |
| Fine, No. 3 | .08½ | @ | .20 |
| **Book, M. F.** | .05 | @ | .07 |
| **Book, S. S. & C.** | .05 | @ | .07½ |
| **Book, Coated** | .08 | @ | .16 |
| **Coated Lithograph** | .07 | @ | .11 |
| **Label** | .07 | @ | .11 |
| **No. 1 Jute Manila** | .07 | @ | .09 |
| **Manila Sul., No. 1** | .03¼ | @ | .05½ |
| **Manila No. 2** | .03 | @ | .04 |
| **No. 1 Kraft** | .05¼ | @ | .06 |
| **No. 2 Kraft** | .03½ | @ | .04 |
| **Southern Kraft No. 1** | — | @ | .03½ |
| **Southern Kraft No. 2** | — | @ | .03½ |
| **Common Bogus** | .03 | @ | .04 |
| (Delivered Philadelphia) | | | |
| **News Print Rolls** | 62.00 | @ | — |
| **Straw Board** | 50.00 | @ | — |
| **News Board** | 32.50 | @ | — |
| **Chip Board** | 30.00 | @ | — |
| **Wood Pulp Board** | 85.00 | @ | 95.00 |
| **Binder Boards—** | | | |
| No. 1, per ton | 75.00 | @ | — |
| No. 2, per ton | 68.00 | @ | — |
| Carload lots | 66.00 | @ | 70.00 |
| **Tarred Felts—** | | | |
| Regular | 55.50 | @ | 57.00 |
| Slaters (per roll) | .84 | @ | .94 |
| **Best Tarred, 1-ply (per roll)** | 1.95 | @ | 2.10 |
| **Best Tarred, 2-ply (per roll)** | 1.50 | @ | 1.60 |
| **Best Tarred, 3-ply** | 2.00 | @ | 2.25 |

### Domestic Rags (New)
(Price to Mill, f. o. b. Phila.)

| | | | |
|---|---|---|---|
| **Shirt Cuttings—** | | | |
| New White, No. 1 | .07 | @ | .08 |
| New White, No. 2 | .06 | @ | .06½ |
| Light Silesias | .05½ | @ | .06 |
| Silesias, No. 1 | .07 | @ | .09 |
| Black Silesias, soft | .05 | @ | — |
| New Unbleached | .07½ | @ | .08 |
| Washable, No. 1 | .03½ | @ | .04 |
| **Blue Overall** | .06 | @ | — |
| **Cottons—According to grades—** | | | |
| Washable, No. 2 | .02½ | @ | .03 |
| New Blue | .02½ | @ | .03 |
| Fancy | .04 | @ | — |
| New Black Soft | .04 | @ | .05 |
| New Light Seconds | .02 | @ | .02½ |
| New Dark Seconds | 1.85 | @ | 2.00 |
| **Khaki Cuttings—** | | | |
| No. 1 O. D. | .05 | @ | — |
| No. 2 Mixed | .04 | @ | .04¼ |
| **Corduroy** | .02½ | @ | .03 |
| **New Canvas** | .07½ | @ | .08 |
| **New Black Mixed** | .03 | @ | .03½ |

### Domestic Rags (Old)

| | | | |
|---|---|---|---|
| **White No. 1—** | | | |
| Repacked | 3.50 | @ | 4.00 |
| Miscellaneous | 3.00 | @ | 3.50 |
| M. G. | 5.00 | @ | — |
| **Thirds and Blues—** | | | |
| Miscellaneous | 1.50 | @ | 1.75 |
| Repacked | 2.00 | @ | 2.25 |
| **Black Stockings (Export)** | 3,80 | @ | 4.00 |
| **Roofing Stock—** | | | |
| Foreign No. 1 | 1.15 | @ | 1.25 |
| Repacked | .80 | @ | .90 |

### Bagging
(F. o. b. Phila.)

| | | | |
|---|---|---|---|
| **Gunny, No. 1—** | | | |
| Foreign | 1.50 | @ | 1.60 |
| Domestic | 1.75 | @ | — |
| Manila Rope | 2.75 | @ | 3.00 |
| **Sisal Rope** | 1.25 | @ | 1.50 |
| **Mixed Rope** | 1.10 | @ | 1.25 |
| **Scrap Burlaps—** | | | |
| No. 1 | 1.50 | @ | 1.60 |
| No. 2 | 1.10 | @ | 1.20 |
| **Wool Tares, heavy** | 3.00 | @ | — |
| Mixed Strings | 1.15 | @ | 1.25 |
| **No. 1, New Light Burlap** | 2.50 | @ | 2.75 |
| **New Burlap Cuttings** | 2.00 | @ | 2.25 |

### Old Papers
(F. o. b. Phila.)

| | | | |
|---|---|---|---|
| **Shavings—** | | | |
| No. 1 Hard White | 2.60 | @ | 2.65 |
| No. 2 Hard White | 2.30 | @ | 2.35 |
| No. 1 Soft White | 2.25 | @ | 2.50 |
| No. 2 Soft White | 1.40 | @ | 1.60 |
| No. 1 Mixed | .90 | @ | 1.00 |
| No. 2 Mixed | .60 | @ | .70 |
| **Solid Ledger Stock** | 1.50 | @ | 1.60 |
| **Writing Paper** | 1.05 | @ | 1.25 |
| **No. 1 Books, heavy** | 1.00 | @ | 1.15 |
| **No. 2 Books, light** | .90 | @ | .95 |
| **No. 1 New Manila** | 2.15 | @ | 2.30 |
| **No. 1 Old Manila** | 1.50 | @ | 1.60 |
| **Print Manila** | .50 | @ | .60 |
| **Container Manila** | .45 | @ | .50 |
| **Old Kraft** | 1.25 | @ | 1.30 |
| **Common Paper** | .25 | @ | .30 |
| **No. 1 Mixed Paper** | .25 | @ | .30 |
| **Straw Board. Chip** | .35 | @ | .40 |
| **Binders Board. Chip** | .35 | @ | .45 |
| **Corrugated Board** | .50 | @ | .60 |
| **Overissue News** | .40 | @ | .45 |
| **Old Newspaper** | .25 | @ | .30 |

## BOSTON

### Paper
(F. o. b. Mill)

| | | | |
|---|---|---|---|
| **Ledgers—** | | | |
| Sulphite | .07½ | @ | .12½ |
| Rag Content | .15 | @ | .30 |
| All Rag | .38 | @ | .52½ |
| **Bonds—** | | | |
| Sulphite | .06½ | @ | .11½ |
| Rag content | .15 | @ | .30 |
| All rag | .36½ | @ | .65 |
| **Writings** | .06½ | @ | .20 |
| Superfines | .11 | @ | .31 |
| **Book, Super** | .06 | @ | .09 |
| **Book, M. F.** | .05½ | @ | .08½ |
| **Book, Coated** | .08½ | @ | .18 |
| **Coated Litho** | .09 | @ | .12 |
| **Label** | .09½ | @ | .15 |
| **Jute Manila No. 1** | .11 | @ | .13 |
| **Manila, Sul. No. 1** | .04¾ | @ | .06½ |
| **Manila, Sul. No. 2** | .03¾ | @ | .04½ |
| **No. 1 Kraft** | .04½ | @ | .05¾ |
| **No. 2 Kraft** | 0.3½ | @ | .04¼ |
| (F. o b. Boston) | | | |
| **Southern Kraft** | .03½ | @ | .03¾ |
| (F. o. b. destination in carload lots, f. o. b. mill in less than carload lots.) | | | |
| **Common Bogus** | .02 | @ | .02¾ |
| Delivered New England points | | | |
| **News Print, rolls** | 61.50 | @ | — |
| **Straw Board, rolls** | .009 | — | @52.50 |
| **Straw Board in Sheets, basis 35s to 70s** | — | @ | 50.00 |
| **Filled News Board** | 32.50 | @ | — |
| **Chip Board** | 30.00 | @ | — |
| **Chip Board (Creasing)** | 32.50 | @ | — |
| **Single Manila Lined Chip** | 45.00 | @ | — |
| **Single White, Patent Coated News Board** | | | |
| Bender, No. 1 | 60.00 | @ | 75.00 |
| Bender, No. 2 | 55.00 | @ | 65.00 |
| **Wood Pulp Board** | 75.00 | @ | 80.00 |
| **Binder Boards** | 67.50 | @ | 75.00 |

### Old Papers
(F. o. b. Boston)

| | | | |
|---|---|---|---|
| **Shavings—** | | | |
| No. 1 Hard White | 3.25 | @ | 3.75 |
| No. 2 Hard White | 2.60 | @ | 2.90 |
| No. 1 Soft White | 2.25 | @ | 2.40 |
| No. 1 Mixed | .90 | @ | 1.00 |
| No. 2 Mixed | .60 | @ | .65 |
| **Solid Ledger Books** | 1.75 | @ | 2.25 |
| **Overissue Ledger Stock** | 1.35 | @ | 1.60 |
| **Mixed Ledgers** | 1.15 | @ | 1.30 |
| **No. 1 Books, heavy** | .80 | @ | 1.00 |
| **No. 1 Books, light** | .55 | @ | .70 |
| **Crumpled Stitchless Book Stock** | 1.00 | @ | 1.25 |
| **Manila Env. Cuttings** | 1.85 | @ | 2.00 |
| **No. 1 Old Manila** | — | @ | 1.00 |
| **White Blank News** | 1.50 | @ | 1.60 |
| **Kraft No. 1** | — | @ | 1.10 |
| **Manila** | .80 | @ | .90 |
| **No. 1 Mixed Paper** | — | @ | .16 |
| **Overissue News** | — | @ | .40 |
| **Old Newspapers** | .25 | @ | .30 |
| **Box Board, Chip** | .16 | @ | .20 |
| **Corrugated Boxes** | .35 | @ | .40 |

### Bagging
(F. o. b. Boston)

| | | | |
|---|---|---|---|
| **Gunny No. 1—** | | | |
| Foreign | — | @ | 1.80 |
| Domestic | 1.60 | @ | — |
| **Manila Rope—** | | | |
| Foreign | 2.25 | @ | — |
| Domestic | 2.50 | @ | — |
| **Transmission Rope** | 1.75 | @ | — |
| **Mixed Strings** | — | @ | .70 |
| **Jute Rope** | — | @ | 1.05 |
| **Jute Carpet Threads** | .90 | @ | 1.05 |
| **Bleachery Burlap** | — | @ | 3.25 |
| **No. 1 Scrap Burlap** | — | @ | 1.25 |
| **Scrap Sisal** | 1.35 | @ | 1.40 |
| **Scrap Sisal for shredding** | — | @ | 1.50 |
| **Wool Tares, heavy** | 1.30 | @ | — |
| **New Burlap Cutting** | 1.75 | @ | 2.00 |
| **Australian Pouches** | 2.50 | @ | — |
| **Heavy Baling Bagging** | — | @ | 1.75 |
| **Paper Mill Bagging** | — | @ | .85 |
| **Bagging No. 2** | .50 | @ | — |
| **No. 1 Burlap** | — | @ | 3.50 |

### Domestic Rags (New)
(F. o. b. Boston)

| | | | |
|---|---|---|---|
| **Shirt Cuttings—** | | | |
| New White No. 1 | .06½ | @ | .07 |
| New White No. 2 | — | @ | .06 |
| Silesias No. 1 | .06 | @ | .06¼ |
| New Unbleached | — | @ | .08 |
| Fancy | .04 | @ | .04½ |
| Washable | .04 | @ | .04½ |
| **Cottons—According to grades** | | | |
| Blue Overalls | .06¼ | @ | .06¾ |
| New Black, soft | .04 | @ | .04¼ |
| Khaki Cuttings | .04 | @ | .04¾ |
| O. D. Khaki | .04½ | @ | .05 |
| Corduroy | .03 | @ | .03½ |
| New Canvas | .08 | @ | .08¼ |

### Domestic Rags (Old)
(F. o. b. Boston)

| | | | |
|---|---|---|---|
| **Canvas** | .04½ | @ | — |
| **White No. 1—** | | | |
| Repacked | 4.75 | @ | 5.25 |
| Miscellaneous | 5.00 | @ | — |
| **White No. 2—** | | | |
| Repacked | .04½ | @ | .05 |
| Miscellaneous | .03½ | @ | .04 |
| **Twos and Blues** | 2.50 | @ | 2.75 |
| **Thirds and Blues—** | | | |
| Repacked | 1.75 | @ | 2.00 |
| Miscellaneous | 1.50 | @ | 1.75 |
| **Black Stockings** | 3.25 | @ | 3.50 |
| **Roofing Stock—** | | | |
| No. 1 | .75 | @ | .80 |
| No. 2 | .65 | @ | .70 |
| No. 3 | .50 | @ | .60 |
| No. 4 | — | @ | .60 |

### Foreign Rags
(F. o. b. Boston)

| | | | |
|---|---|---|---|
| **Dark Cottons** | .75 | @ | .85 |
| **New No. 1 White Shirt Cuttings** | 7.75 | @ | 8.00 |
| **Dutch Blues** | — | @ | 1.80 |
| **New Checks & Blues** | 4.00 | @ | 4.50 |
| **Old Fustians** | 1.65 | @ | 1.75 |
| **Old Linsey Garments** | .85 | @ | .95 |

## TORONTO

### Paper
(F. o. b. Mill)

| | | | |
|---|---|---|---|
| **Bond—** | | | |
| No. 1 Sulphite | .12½ | @ | — |
| No. 2 Sulphite | .09¾ | @ | — |
| No. 1 Colored | .13½ | @ | — |
| No. 2 Colored | .09½ | @ | .10½ |
| **Ledgers (sulphite)** | — | @ | — |
| **Ledgers, No. 1** | .36 | @ | — |
| **Ledgers, No. 2** | .27 | @ | — |
| **Writing** | .09½ | @ | .10 |
| **Book—** | | | |
| No. 1 M. F. (carloads) | 7.12½ | @ | 7.60 |
| No. 2 M. F. (carloads) | 6.90 | @ | 7.35 |
| No. 3 M. F. (carloads) | 6.65 | @ | 7.15 |
| No. 1 S. C. (carloads | 7.60 | @ | 8.10 |
| No. 2 S. C. (carloads | 7.35 | @ | 7.85 |
| No. 3 S. C. (carloads | 7.12½ | @ | 7.60 |
| No. 4 S. C. (carloads | 5.95 | @ | 6.40 |
| No. 1 Coated and Litho | 13.25 | @ | — |
| No. 2 Coated and Litho | 12.25 | @ | — |
| No. 3 Coated and Litho | 10.00 | @ | 11.50 |
| Coated tinted | 14.50 | @ | — |
| **Wrapping—** | | | |
| Rag Brown | 4.95 | @ | — |
| White Wrap | 5.25 | @ | — |
| "B" Manila | 5.00 | @ | — |
| No. 1 Manila | 5.40 | @ | — |
| Fiber | 5.40 | @ | — |
| Kraft, M. F. | 5.90 | @ | — |
| Kraft No. 2 | 5.40 | @ | — |
| (Delivered Toronto) | | | |
| **News, per ton—** | | | |
| Rolls (contract) | 61.50 | @ | 62.00 |
| Sheets | 67.00 | @ | — |

### Pulp
(F. o. b. Mill)

| | | | |
|---|---|---|---|
| **Ground Wood** | 30.00 | @ | 32.00 |
| **Sulphite easy bleaching** | 50.00 | @ | — |
| **Sulphite, news grade** | 70.00 | @ | — |
| **Sulphite, bleached** | 72.50 | @ | 75.00 |
| **Sulphate** | 60.00 | @ | — |

### Old Waste Paper
(In carload lots, f. o. b. Toronto)

| | | | |
|---|---|---|---|
| **Shavings—** | | | |
| White Env. Cut | 2.80 | @ | — |
| Soft White | 2.60 | @ | — |
| White Blk. News | 1.50 | @ | — |
| **Book and Ledger—** | | | |
| Flat Magazine and Book Stock (old) | 1.10 | @ | — |
| Light and Crumpled Book Stock | 1.20 | @ | — |
| Ledgers and Writings | — | @ | — |
| **Manilas—** | | | |
| New Manila Cut | 1.50 | @ | — |
| Printed Manilas | .80 | @ | — |
| Kraft | 1.90 | @ | — |
| **News and Scrap—** | | | |
| Strictly Overissue | .70 | @ | — |
| Strictly Folded | .70 | @ | — |
| No. 1 Mixed Paper | .60 | @ | — |

### Domestic Rags
(Price to mills, f. o. b. Toronto)

| | | | |
|---|---|---|---|
| **No. 1 White Shirt Cuttings** | .09½ | @ | .10 |
| **Fancy Shirt Cuttings** | .06 | @ | .06¾ |

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# PAPER TRADE JOURNAL

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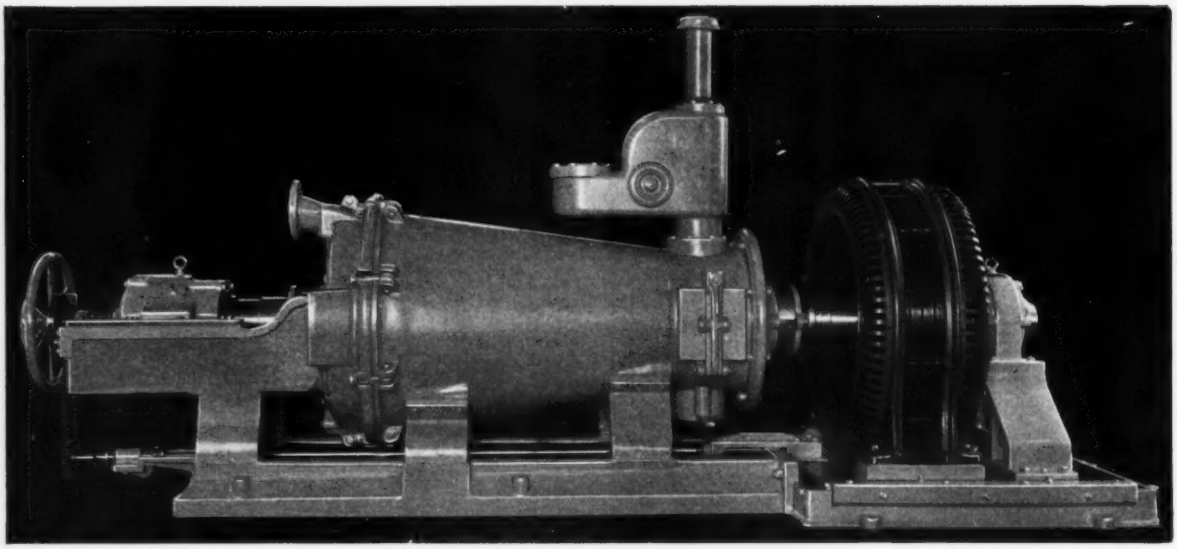

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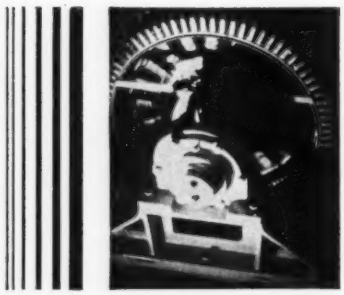
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